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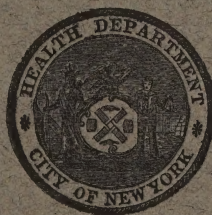
DECEMBER, 1918

THE ESTABLISHMENT AND CONDUCT OF A TUBERCULOSIS SANATORIUM

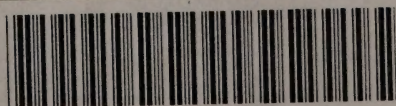
BY

CHARLES B. SLADE, M.D.

VISITING PHYSICIAN TO THE MUNICIPAL SANATORIUM AT OTISVILLE, N. Y.



*"Public health is purchasable. Within natural limitations
a community can determine its own death rate."*



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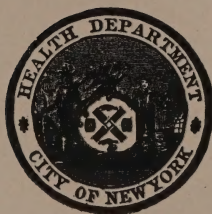
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SANATORIUM**

BY

CHARLES B. SLADE, M.D.

VISITING PHYSICIAN TO THE MUNICIPAL SANATORIUM AT OTISVILLE, N. Y.



PUBLISHED UNDER AUSPICES OF
BUREAU OF PUBLIC HEALTH EDUCATION
NEW YORK CITY DEPARTMENT OF HEALTH
ROYAL S. COPELAND, M. D.
COMMISSIONER

CATHOLIC ORIENTATION IS A RARE VIRTUE

*The essentials of a tuberculosis sanatorium
are the open spaces and
a zest for life*

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PREFACE.

The rapidly growing increase in the number and size of tuberculosis sanatoria has drawn many more physicians and laymen into this work. Although the literature on tuberculosis is prodigious in amount, the writer's attention was called to the fact that there was no single book containing only that matter which pertains to the establishment and conduct of sanatoria. Indeed it is the very voluminous but scattered nature of the literature which renders the information, salient to the scope of this work, inaccessible. Although free use is made of some familiar facts, the plans and directions given herein are based upon, or have been verified by, the writer's experience and observation, as Examining and Visiting Physician to the Municipal Sanatorium at Otisville, N. Y.

It has been my intention to place in this volume, with systematic arrangement, the information which is necessary for the establishment and conduct of a tuberculosis sanatorium. Special effort has been made to avoid long discussional text; in order that the essentials will be quickly available. Only enough illustrations are employed to elucidate the text. As a guide and reference handbook, it is hoped that this work will be helpful.

For valuable aid in the collection of data and photographs the writer wishes to express his grateful appreciation to Dr. Edward S. McSweeney, of New York City; Dr. R. J. Wilson, Director, Dr. W. T. Cannon, Physician-in-Charge, Mr. J. J. Crane, Superintendent, and other members of the staff at the Otisville Municipal Sanatorium.

CHARLES B. SLADE.

CHAPTER I. INTRODUCTORY.

There is some intuition which usually directs the ill members of the animal kingdom to a remedy. The dog, a carnivorous animal, eats grass to stimulate peristalsis of his nutrient canal when that function is inefficient. The fish gasps at the surface of the water, for the oxygen of the air, when it can no longer find enough in stale water. Is it, therefore, strange that man has always sought the clean air of rural districts when his respiratory organs became so compromised by disease that he could no longer properly aerate his blood with urban air? It is true that ignorance and superstition have often induced those with pulmonary disease to shun and avoid the air, but this was always a result of warped reasoning, never by natural inclination.

In 1899 the writer had a guide, on the peninsula of Lower California, whose case illustrated the instinctive call to nature and the wild open places felt by one who finds his lungs diseased. This Mexican was then about sixty years old. When he was twenty (1860) he had a profuse pulmonary hemorrhage. Through this and cough, with loss of weight, he learned that he had consumption. There was a belief prevalent in the tribe to which he belonged, in the State of Sonora, Mexico, that the only way to recover was to drink quantities of fresh warm beef's blood. Duarte, that was the name of my guide, conceived the idea that, if beef's blood was good, deer's blood would be better. He also thought that a life in the open, which would be necessary in order to obtain the fresh deer's blood, would aid the cure. So he crossed the gulf of Lower California and went, alone and ill as he was, into the sparsely settled peninsula. He carried only a rifle and dried beans. There, on the aired mesas and wooded hills, he shot deer. Always he would collect the fresh blood in a tin cup and drink it—"warm," as he said. He ate wild onions that grow on the mesas, so did not have scurvy. Two years of this open lazy life of the hunter (in spite of the indigestible fresh raw blood) restored his health completely. Certainly he was unusually well and healthy when he was my guide thirty-eight years later.

No scientific deductions directed Duarte to the aired lands in 1860. Neither was it scientific knowledge that called Doctor Trudeau to the Adirondack wilderness in 1872.

The first description of tuberculosis found in literature was recorded by Hippocrates about four hundred years before the birth of Christ. It was first called contagious nineteen hundred and fifty years later (1550 A.D.) by an Italian physician, Montano. The first record of an autopsy having been performed upon a person who had died from tuberculosis was some time between 1682 and 1771 A.D. This was done by Morgagni, another Italian physician, who also believed the disease was contagious. The belief that consumption was contagious had become so prevalent in Italy, France, Spain and Portugal by the end of the eighteenth century,

that some cities in those countries passed laws for the compulsory notification of the authorities; who, in some instances, enforced isolation of those sick with consumption and disinfection of the premises after death.

The measures, based probably upon empirical ground, were short-lived. In the first third of the next century (19th) there seemed to be little attention paid to combating the spread of tuberculosis. Even the medical profession did not appear to entertain the belief that it was a contagious or preventable disease. If, in the eighteenth century, those physicians who believed the disease contagious had arrived at their conclusions by logical proofs they did not record them. In fact it is fairly well established that the belief in the contagiousness of tuberculosis, as held by Montano and Morgagni and their contemporaries, was a result solely of clinical observations. They had observed the development of consumption in apparently healthy persons who had been in close contact with advanced cases of the disease. Although careful clinical observation is often quite reliable in determining the infectious or non-infectious nature of disease, it is less convincing to the average mind and is more likely to be disregarded, as the years pass, than when the bacterial causative agent is identified. This was particularly true in tuberculosis, because the initial infection often antedates the development of clinical symptoms by many years. In such a disease as measles, though the causative microorganism may never be discovered, it is hard to believe that its contagiousness could ever be lost sight of.

Animal experimentation had been practiced, in anatomical research, for many years but it was not until about the middle of the nineteenth century that it was employed for the study of disease in man. By this means, in 1860, Villemin, a French physician, proved conclusively that tuberculosis was transmissible from the sick to the well. He inoculated animals with tuberculosis, reproducing the disease in the lungs and other body structures. By his experiments he proved that the infective or causative agent was present in the tubercle, the discharges from the tubercle and also in the blood of the diseased person. When Villemin reported his researches, Virchow, a German physician, was coming into prominence. He had propounded a theory on the origin and histology of tuberculosis which Villemin's work proved to be erroneous. Virchow refused to accept and violently opposed Villemin's deductions. Doctor Allen Krause, who is certainly not prejudiced against Teutonic scientists, says that Virchow "set the clock back fifty years" in the advance of knowledge concerning the etiology of this disease. It would thus seem that the, even then, aggressive German school had already begun to demand, with characteristic bias, and to receive subservience from the rest of the world of science. So that it was not until Koch, in 1882, isolated the causative agent (tubercle bacillus), which Villemin had already proven was present, did the medical world begin to apply this knowledge to the practical control of tuberculosis.

The microscope was invented in the seventeenth century by a Jesuit priest named Kircher. It was at first a crude instrument as compared with those in use at the present time. Yet, without this, no disease germs

could ever have been actually seen. The subsequent additions and improvements were lower grade accomplishments than the invention of the first instrument, they followed inevitably, but are now essential to the work being done in bacteriology. In 1837 Donne first discovered microbes in diseased tissue. At this time, however, and for many years thereafter the microscope made its greatest contributions to medical knowledge in the field of histology—normal and pathological. Pasteur was the first to combine culture and staining methods with the microscope for the isolation and study of specific microorganisms of individual disease.

Sanatoria.—The term, sanatorium, is derived from the Latin verb sanare, to cure. Though this word (sanatorium) was not employed, the idea originated and was first employed in England by Dr. George Bodington about 1840. At this time special tuberculosis hospitals were established in England. Some of these institutions were in and some near large cities.

In 1859 Dr. Herman Brehmer, a German who thought that consumption was due to an abnormally small heart, established what he called a "heilanstalt" (healing institution) in the mountains of Silesia for the exclusive treatment of this disease. Believing that an undeveloped heart was the underlying cause of tuberculosis, Brehmer had his patients, after their fever subsided, do graded mountain climbing to develop and strengthen the heart. He and his student, Dettweiler, who later also established a tuberculosis sanatorium, were the first to maintain that special climate and altitude were essential features for the successful treatment of consumption. Later observations have proven that neither of these features are essential. That an abundance of pure air is of prime importance was proven, with animal experimentation, by Dr. E. L. Trudeau in 1886. It should be noted that Dettweiler did not share Brehmer's erroneous belief that a small heart was the cause of consumption.

In 1876 Doctor Edward L. Trudeau established the Adirondack Cottage Sanatorium on Saranac Lake. He was the first to fully appreciate and apply the dual necessity of rest and personal equation in the sanatorium. In 1891 Doctor Vincent Y. Bowditch opened his sanatorium at Sharon, near Boston. This was the second tuberculosis sanatorium established in the United States. Up to this time all tuberculosis sanatoria, if they are to be distinguished from tuberculosis hospitals, such as had been in use in England for fifty years, were private undertakings which did not receive state or municipal support.

It was in 1898 that the first state sanatorium was opened by Massachusetts.

New York City was the first municipality to establish a tuberculosis sanatorium. The Municipal Sanatorium at Otisville, N. Y., under the direction of the Department of Health of New York City, was opened on July 11, 1906. It was due to the untiring efforts of Dr. Hermann M. Biggs, who was then General Medical Officer of the Department of Health, that this innovation was established. It has been with much pleasure and satisfaction that the writer has given a large share of his attention, as Visiting Physician, to aid in the perfection of this institu-

tion, from its inception to the present time. It also gives him pleasure to acknowledge the devoted services of various members of the resident staff, many of whom have gone to other fields of valuable work, and the generous support of successive Commissioners.

There are now in operation in the United States more than six hundred municipal, state and private tuberculosis sanatoria. As the term, sanatorium, signifies, these institutions were first established for the cure of consumption. Up to their advent consumption was believed to be not only incurable but invariably fatal. Indeed, since at that time a diagnosis was never made until the disease was well advanced to what we now call the third stage, and as the treatment excluded all fresh air, practically all known cases did die in from six months to two years after a diagnosis was reached. When the sanatoria began to show patients who had improved to such an extent that all of their cardinal symptoms had disappeared, they were called "cures." There then arose a fairly prevalent belief that these patients were absolutely cured, in the sense that "cure" is applied to most other diseases. The term "arrested" has since been exchanged for "cured," because we know that the disease is not eradicated as is the case in recovery from other diseases, such as pneumonia, typhoid fever, scarlet fever and many others. Recurrence of activity in healed tuberculous lesions is rather the rule than the exception. They may and often do become rehealed many times under the re-establishment of favorable conditions. It is often said that "tuberculosis is one of the most curable of chronic diseases." In fact, there are many instances where the same case has been recorded as "cured" repeatedly.

Of all factors influencing the course of tuberculosis the mental attitude of the patient, which is usually subject to the influence of his or her physician, weighs 50 per cent. or more in determining the issue. The mental attitude is of importance in every chronic disease, but in tuberculosis most of all. This does not appear strange when we recall the radical sacrifices of environment, ambition and associations so often demanded of the patient by intelligent treatment of the disease. In no other chronic affection is the sufferer called upon to make a more abject acquiescence with fate. On the other hand, the reward, in renewed health and prolonged life, is infinitely greater here than in most other chronic disease. A beneficent example of the eternal law of compensation. In view of the above it is evident how futile would be the application of any plan for the treatment of tuberculosis which is not sufficiently flexible to be adapted to various patients with sympathy and understanding. One often hears physicians, in learned discussions, employ the metaphor, "trying to put a square peg in a round hole," when deprecating the use of a stereotyped treatment for every case of a given disease. Also, that "every case is a law unto itself" in treatment. In spite of the frequency of these pleas for specialization probably the greatest danger, for even the learned specialist, is that he permit himself to become perfunctory in advising tuberculous patients.

Not until Dr. Edward L. Trudeau brought his fund of christian brotherly sympathy to the aid of the human family in its struggle against

this almost universal enemy (75 to 90 per cent. of the race are said to be infected before middle age), did physicians really know the true value of boundless confidence between patient and physician in the treatment of tuberculosis. Through his example we have come to know the importance of the sensitive moulding of fundamental essentials to the needs and peculiarities of each and every patient. This great truth did not come from Dr. Trudeau's clear brain, as a scientific deduction, as most advances in medicine are attained. It flowed from his heart, a boundless stream of love which had its origin in a close personal bereavement in his youth, the loss of his only brother, whom he nursed through to the end of an attack of florid phthisis. It was augmented by his own contraction of the disease, a prolonged stay in the silent wilderness and the generosity and devotion of a host of most unusual friends. It would seem as though God's great human laboratory was bent upon the production of this boon for the victims of the great white plague, that all of its apparatus and media had been carefully adjusted to develop the finished product, Edward Livingston Trudeau.

A tuberculosis sanatorium, at the present time, should have three primary objects, namely: *Treatment, Education and Segregation.*

It is the writer's opinion that every institution devoted exclusively to the care of tuberculous persons, whether they be located in a city or in the country, should be constructed and conducted as sanatoria. The term "hospital" should not be applied to them because, in the public mind, tuberculosis *hospital* suggests a "pest house" and hopelessness. Such an institution within a city could be called an *infirmary*, and be conducted as an adjunct to a sanatorium. It could receive cases too sick to go directly to the sanatorium. Some of these cases would improve sufficiently to be transferred to the sanatorium later. Its objects should also be *Treatment, Education and Segregation.*

Besides treating patients to accomplish arrest ("cure") of their disease, while they are in the sanatorium, they must be educated, while there, in the ways to avoid return of activity in their lesions and to prevent the spread of infection to others after they are discharged. Segregation of sputum positive cases, where other and effective means of isolation and control of the infection can not be secured, should be an object of every anti-tuberculosis agency, including the sanatoria. The highest possible development and humane blending of these three functions—treatment, education and segregation—should be the object of every tuberculosis sanatorium. The disease is one in all of its types and stages. It is one big human problem and all the special activities and institutions established to combat it should be closely allied. It would be preferable to have them all under one management and so conducted as to make the victims of the disease as cheerful, hopeful and useful as possible, while accomplishing the three objects enumerated.

The first, and as far as the writer knows the only, tuberculosis sanatorium thus far established entirely by an industrial company, as a business economy, and solely for its employees, was opened at Mt. McGregor, N. Y., in 1913, by the Metropolitan Life Insurance Company. Since it was, from the first, in the hands of an experienced business administra-

tion with ample funds, this sanatorium is one of the very few of such institutions which was built on a matured plan, complete in every detail before it was opened for the reception of patients.

The establishment of most sanatoria has so many obstacles to overcome it is often necessary to begin on a modest scale, employing practical results and obvious further needs as the best argument for financial support to provide for growth and completion.

While considering or applying the various factors and means involved in the treatment and control of tuberculosis it is necessary to keep clearly in mind the fundamental principles and objects. They are the same in all diseases, namely:

1. *Discovery of existing cases*—including diagnosis.*

The personal skill, experience and good judgment of the physician still remain the deciding factors in the diagnosis of tuberculosis, when acid fast bacilli can not be found.

2. *Treatment of existing cases.*

No matter what detail method we employ, the treatment of tuberculosis must be a humane blending of medical knowledge and the personality and circumstances of the patient.

3. *Prevention of new cases.*

Here the personal element does not apply. In tuberculosis it consists in the destruction of the tubercle bacillus, after it has left the body and before it gains entrance to another body, or its forced retention in the already infected body, by healing of the lesion. Prevention of new cases is further aided by maintenance of the highest possible standard of health and resistance in those likely to be exposed to infection.

Artificial immunity can be produced to prevent new cases of some diseases; notably smallpox, rabies, diphtheria, typhoid fever, cholera and tetanus, but no effective means have yet been devised which produces immunity to tuberculosis. It would seem, since tuberculous infection occurs in most people at very early ages, often producing clinical symptoms only in later years, that such an immunity could be available and effective in either of the following ways:

Either the immunizing agent might be sufficiently benign to administer it universally in the first hours of life, and thus prevent infection, or it might be given later in life to insure the continued localization of any quiescent lesion that might be in the body. It is conceivable that either or both of these methods might be developed in the future. It is in this direction that the real control and eradication of tuberculosis will probably be accomplished. Either an artificial immunity will be devised or evolutionary processes will result in the gradual development of a natural immunity, or loss of affinity between the human body and the tubercle bacillus. Since human effort and ingenuity have progressed faster than evolution in the instances of smallpox, tetanus and other diseases, it is reasonable to hope that our efforts may be similarly rewarded in the case of tuberculosis.

NOTE.—* The discovery of existing cases, except as involved in the diagnosis in applicants for admission to sanatoria, does not lie within the scope of this book.



CHAPTER II.

SITE.

Climate and Altitude.—Early literature and text-books laid much stress upon the beneficial effects of high altitudes, with their rarefied air, on consumption. The air among the pines was supposed, by many, to exert some curative influence. Patients who had any chronic pulmonary disease were directed to a climate different from the one in which they resided. Most of the population normally lived, as they do now, near the sea level in cities and towns. Therefore, any change was to a higher altitude, less populated and a life more in the open air. So that a large percentage improved. In this way high altitude gained its reputation. Elevated areas usually have a higher average of bright clear days than lowlands, which permits one to spend more time in the open air, another distinctly beneficial factor. Furthermore, since pine trees are commonly found growing at many high altitudes, there arose a belief that the volatile element of pine balsam, which can be detected by the olfactory organs in pine forests, was curative. Even now various products of pine tar are administered to those with pulmonary affections, both internally and as vapors, by some reputable physicians in the belief that they are curative. Though these medicinal agents are often soothing and agreeable to the respiratory mucous membrane, they can have no direct influence upon the arrest of tuberculous lesions. Their popularity unquestionably owes its origin to the prevalence of pine trees in the regions to which those with pulmonary disease were sent, and where they often improved, a mere coincidence.

Doctor Trudeau, in the early years of the Adirondack Sanatorium, was of the opinion that the Adirondack climate possessed peculiar healing qualities. As a matter of fact, the Adirondack climate is as trying upon an invalid as any extra-urban climate in the world. No doubt, if one is not ill, with greatly lowered vitality and is amply protected from the extreme cold, the winter climate in the Adirondacks is as beneficial as any other. The remainder of the year in the great north woods is associated with a large proportion of cloudy, damp and rainy days. This is depressing to many, besides keeping them indoors, which is not favorable for consumptives. However, since this occurs chiefly in summer, when windows and doors are open, it does not exclude the air enough to prevent continued improvement in most cases.

Many patients who went to the Adirondacks and came under Doctor Trudeau's excellent guidance improved to a degree hitherto thought impossible in consumption. And, as the extreme cold was the one outstanding memory of their stay there, this element, extreme cold, came to be regarded as peculiarly curative; another false interpretation of a mere coincidence.

Doctor Osler says, "The requirements of a suitable climate are: a pure atmosphere, an equable temperature not subject to rapid variations and a maximum amount of sunshine. Given these three factors it makes little difference where the patient goes, so long as he lives an outdoor

life." Again he says, "The cold winter climate seems to be of decided advantage in tuberculosis." Yet, he recommends the southern towns of Aiken, Thomasville and Summerville as "delightful winter climates for tuberculosis cases." This authority is very specific when he says that "Thin irritable patients with chronic tuberculosis and a good deal of emphysema are better at the sea level."

Although no particular climate can be said to be specially curative for this disease, there are some qualities which are favorable and some unfavorable in the majority of cases. The writer does not think that rapid variations in temperature are of importance. They can be counteracted by artificial means. Favorable qualities in a climate are: pure air and a maximum amount of sunshine. Unfavorable qualities are: impure air, from dust or other substances; strong, cold or otherwise annoying wind, excessive rains or moisture and excessive heat or cold beyond the power of artificial relief. Certainly no patient is improved by being made miserable from any cause.

Given a properly regulated life in the open, day and night, the difference in results depends almost entirely upon the peculiarities of the individual patients and the type and stage of disease. Some do better in one place than another. When, by experience, it is learned where a patient does best, there he or she should remain.

As to *altitude*; some patients do best at high altitudes, some at moderate altitudes and some near or at sea level. Very high altitudes, above six or seven thousand feet, possess no virtue not obtainable at a lower level, and are positively injurious to many consumptives. Especially is this the case where the disease is advanced or there is cardiac impairment, either muscular or valvular. Any altitude up to about five thousand feet, where other factors are favorable, is equally beneficial in the vast majority of these patients susceptible of substantial improvement. One feature in favor of moderate elevations is the cool nights, in the warm season, which conduce to sound and refreshing sleep. Sleep is one of the most important factors that aid recovery from any disease.

Distance from City or Town.—There are four good reasons why a sanatorium should not be located within or very near a city or town: 1. In such localities the air is more or less contaminated by human habitation, industry and traffic. 2. There are too many distractions close at hand, with temptations to frequent social and business intercourse with outside residents, which is injurious to the patients and others. 3. It would render interference with the proper conduct of the sanatorium more likely by friends of patients and overzealous "uplift" workers. 4. The majority of the patients would be deprived of the distinct benefit which comes from a change into the country, an influence which is part psychological and part physical.

Before the days of almost universal good roads and automobiles it would have been necessary to have any charity or part charity sanatorium within five miles of the chief city or town it served, or within a mile or two of a railroad station, which was not more than sixty or eighty miles from the city. Now it may be said that a sanatorium should be not more than eighty miles by rail, twenty miles by automobile road (if not near

a railroad), from the city or town of supply and direction. A greater distance would necessitate too long a journey for the good of the patients and be too expensive and inconvenient to supply and direct. A distance of twenty to forty miles by rail, or ten to twenty by automobile, meets most requirements to the best advantage. In fact, at any distance up to forty miles, the patients could be carried to and from the sanatorium by special automobile. This would avoid objections, which are sometimes raised, to having patients ride in the regular railroad passenger coaches.

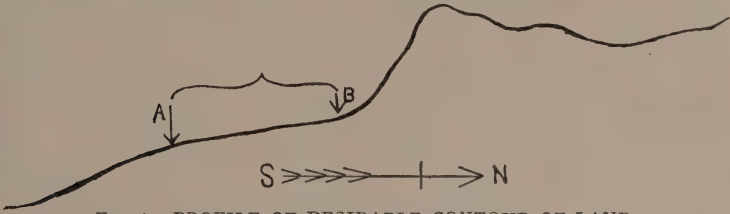


FIG. 1.—PROFILE OF DESIRABLE CONTOUR OF LAND.
A-B, Site for Sanatorium.

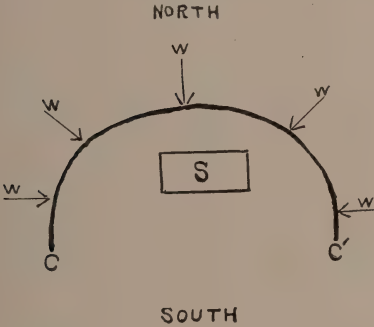


FIG. 2.

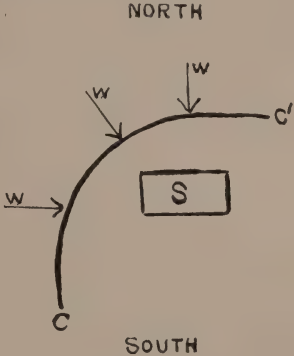


FIG. 3.

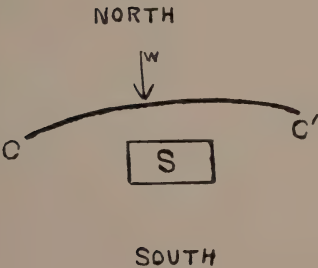


FIG. 4.

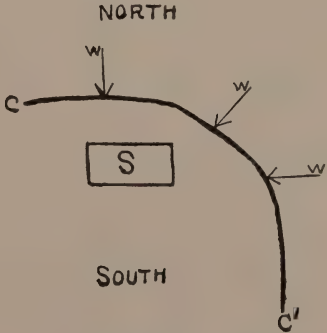


FIG. 5.

FLAT CONTOUR OF SITES FOR SANATORIA.

Lines C-C', direction of protecting crest. S, Sanatorium on protected table. Arrows, W, direction of prevailing disagreeable winds.

Contour of Ground.—The contour of the ground is an important consideration, when choosing the site for a tuberculosis sanatorium. It is desirable to have it located on ground that lies above the rest of the surrounding country. It should be in such a position that the ground continues to rise on one to three sides, above the location of the buildings, if such is obtainable, see Figure 1. This position gives a more attractive outlook and escapes much of the fog and moisture which fills lowlands and valleys. The buildings should be so placed that the portion of the hill or mountain, which rises above the actual level of the sanatorium, affords protection against the prevailing disagreeable winds. In most localities these are the cold damp winds of winter and come from the west, northwest, north, northeast or east. Therefore, an ideal contour of ground, in most localities, would be a gently sloping tableland surrounded on three sides—west, north and east—by a continuous crest high enough to act as an effectual wind-brake, see Figure 2. Trees, with dense evergreen foliage, though less reliable chiefly because they are less permanent, make a fairly effective wind-brake and can be utilized, if present, when the desired contour of ground is not complete.

The ideal horseshoe, or semicircular crest, with enclosed table sloping gently downwards through the opening, to the south, obviously protects against the prevailing disagreeable winds of almost any section. But such a contour of ground is rarely obtainable, and in some localities is not desirable, since it would exclude refreshing breezes in the warm seasons. In almost every locality it is found that the really objectionable winds come from not more than two directions. Either they will come from west, northwest and north, in which case a contour such as that in Figure 3 would afford the necessary protection, or they will come from the north, northeast and east, where the contour in Figure 5 would protect. If they come largely from the north the contour of Figure 4 gives sufficient protection.

Finally, the natural contour or trees may not be available on any site obtainable. In such an instance it is necessary to place and construct the buildings in such a way as to give protection and permit living in the open air without exposure to the worst winds. This should only be resorted to as a last extremity.

Water Supply and Sewage.—Although it is not always possible to have an ample natural gravity supply of pure water, it is a great advantage in many ways. The contour of the land chosen for the site should, when possible, be such that it has a protected and ample watershed at a higher elevation than the tallest building of the sanatorium. The water supply must be sufficient for fire protection, watering lawns and gardens, sprinkling roads and walks, for laundry, toilets, baths, dining hall and drinking purposes. If the watershed is not ample and at an elevation the expense of digging wells and maintaining a pumping station is incurred. Unless the watershed is protected an additional source of water for drinking purposes must be provided. A dual water supply, when one is of doubtful purity, necessitates rigid precautions to avoid the possible drinking of contaminated water.

The contour of the land also has an important bearing upon the

sewage disposal. When the sanatorium is located upon elevated ground it presents no difficulty. This must be considered when choosing a site. Outside toilets, with boxes or pits, may be used temporarily to some extent, but their proper care and disinfection is so nearly impossible that their permanent employment is hardly excusable. In warm weather the odor and atmosphere within the little houses is so objectionable, and in winter they are so cold that they lead to constipation in many patients. Incinerating toilets are employed to some extent, with fair success, but they require much more attention and get out of order much more easily than substantially constructed sanitary plumbing. In fact, at this age, it would be inexcusable to construct a tuberculosis sanatorium which did not include a modern system of sanitary sewage, with an approved method of disposal. Besides the care that should be exercised in the disposal of ordinary sewage, we have here a special problem, the destruction of tubercle bacilli. It is imperative that this be done as some of the sewage is liable to ultimately find its way into a stream or lake that is used as water supply for some region. There are numerous methods of sewage purification. Among those most commonly employed (after the sewage is led by a pipe to a lower level and some distance from the sanatorium) are the following: The septic or settling tank, sprinkling or trickling filters, sand filters and chemical sterilization. Chlorinated lime is the chemical generally used. Some institutions employ all these methods in the order named. When they are combined the sewage is, to all practical purposes, sterile and harmless. Doctor Arthur T. Laird, of Nopeming, infected guinea pigs with the effluent taken directly from the Imhoff tank and treated with one part of calcium hypochlorate to fifty thousand of the mixture; but when the effluent had been passed through a sand filter (after leaving the tank) and then treated with the hypochlorite it did not infect guinea pigs.

Soil, Vegetation and Shade.—In no conditions of life is it so important that the surroundings be in every way conducive to cheerfulness as in a tuberculosis sanatorium. Therefore, every factor which directly or indirectly affects the patients must be considered. Although the soil, vegetation and shade have been given scant or no consideration by many writers upon the sanatorium treatment of tuberculosis, they are of prime importance in the general scheme. The surface soil should contain enough loam, or loam and sand, to support the growth of sod. It must rest upon a subsoil or base sufficiently porous or crevaced to permit quick draining and drying after rainfall or thawing. Sod about the building and on the lawns helps to purify the air, as does all foliage, and keeps the air suspended dust down to a minimum. It is also pleasing to the eye and encourages an outdoor life. A wet boggy lawn imparts an unpleasant moisture to the air, is difficult to keep in proper trim and is generally uninviting. The location and soil should both combine to facilitate surface drainage. Where this is not the case, covered or blind drainage ditches must be constructed.

The cultivation of flowers, in abundance, by the patients should be encouraged in every way. They give occupation and pleasure, and cost almost nothing. Trees and shrubs are also essential, but they should not

be so densely placed, or so close to the buildings that they interfere with liberal and direct sunlight. For this reason it would be undesirable to place a sanatorium in a dense forest, by merely removing the trees from the spaces occupied by the buildings. As has been mentioned, evergreen trees are at times necessary as a windbrake. They are also pleasing to the eye in winter when other trees are bare. There should be enough trees, of ample foliage, placed conveniently to produce shade in abundance to protect the patients from the broiling sun while resting out-of-doors in summer. It is, of course, possible and necessary in some places for the patients to rest on a porch in the shade of its roof. But, for those who are able to move about, it is pleasanter and beneficial to occasionally rest out under the trees. In this connection it is well to remember that no shade tree grows to a really serviceable size in less than ten years, after replanting at the usual sizes. It is therefore almost necessary to have upon the site chosen trees already grown to serve until new trees planted can fill the need.

The respiratory function of plants, including trees, is performed by their foliage. It is this function of plants which completes a very happy cycle, one of the marvelous economies of nature. One of the chief substances inhaled by plants is nitrogen, an element of waste, which is exhaled and otherwise thrown off by animal bodies. The chief element exhaled by plant foliage is oxygen, which is so essential to the animal kingdom, especially to those whose lungs are compromised by tuberculosis.

The Attitude of Residents towards the establishment of a tuberculosis sanatorium in their neighborhood is, not infrequently, an obstacle which has to be overcome when selecting a site. Antagonism to these institutions, though less than it was formerly, is still rather prevalent. It is frequently unreasoning and due to a vague aversion. The most common reasons given are that the infection is dangerous to the health of other residents, and that the business growth and general welfare of the community will be hindered by making outsiders steer clear of the locality. These objections are best answered by the history of places where sanatoria have been long established. These places have invariably improved, both in health and business growth, faster since the sanatoria were located near them than they did before.

One has not far to seek to find the causes for the improvements that have been noted. The improved hygiene and methods for avoiding spread of infections, enforced in the sanatorium, are copied voluntarily by the community. Such education and example can not be confined to the limits of the sanatorium. It is this influence that accounts for the lowered mortality, from tuberculosis as well as from other infectious diseases, noted in those places where sanatoria have been established. The sanatorium is an industry which brings more people and more money. This accounts for the improved business and increased population noted.

In 1905 the town of Mamakating, N. Y., refused to permit the establishment of New York City's municipal sanatorium in that township, on the usual grounds as stated in the preceding paragraph. In 1906, after overcoming some local prejudices and objections, largely through the

efforts of Doctor Frank P. Howser, of Otisville, permission was granted and the sanatorium was located at Otisville, in the township of Mt. Hope. It was opened in July 11, 1906, with five patients. The sanatorium rapidly grew in capacity and, for the last five years, has had 500 to 600 patients at all times. In the village of Otisville and neighboring country there has not developed a single known case of tuberculosis which could have come, directly or indirectly, from the sanatorium patients. This is true, although many of the native residents are employed in the sanatorium. As to the influence upon business, there was practically none in Otisville before the advent of the sanatorium. Real property was of little value and had no market. Since that time real estate has more than trebled in value and is in good demand. Business of all kinds has greatly increased and there is ample employment for all. The greatest calamity that could happen to Otisville now would be for the sanatorium to close or move. There is not the slightest doubt this would be conceded by even those residents who objected most strenuously to the establishment of the sanatorium twelve years ago.

In those localities where sanatoria have been in operation much longer than at Otisville, the mortality from consumption, among the native inhabitants, has markedly decreased. This has been statistically proven in Goebersdorf and Falkenstein, Germany, in Rutland, Mass., and Cravenhurst, Canada. It has also been a striking observation that rarely ever have non-tuberculous attendants in sanatoria, doctors or nurses, contracted the disease. In fact, it is proclaimed by many experienced observers that, on account of the splendid hygienic discipline observed within sanatoria, an intelligent worker there is actually less exposed to tuberculous infection than among average people elsewhere.

CHAPTER III.

PLAN.

The basic essentials of a tuberculosis sanatorium are the open spaces and a zest for life. These principles applied by one with a knowledge of the etiology and pathology of the disease and—common sense, are sure to meet with success. The number and circumstances of patients, as well as the regions involved, vary so widely that no rigid plan could be given which would adequately meet all indications. Nevertheless, experience in construction and conduct of sanatoria has now accumulated to such an extent that we are able to lay down rules which will apply to the vast majority of situations. There are, of course, peculiar situations, where any plans given will have to be modified, either temporarily or permanently, to suit special local conditions.

Capacity of the Sanatorium.—In some cities and localities the incidence of tuberculosis is higher than in others. The known cases ranging from possibly as low as three per thousand in England, to four or five in New York State and nine in France. These figures are based upon the assumption that the average duration of life, after a diagnosis is established, is three years; which is less than the estimate of many authorities. If the

average duration of life is longer, naturally the incidence of tuberculosis among the living is higher.

It is probably conservative to assume that one-third of the known cases in every community are suitable, and with adequate educational propaganda available for sanatorium treatment. Therefore, any plan for sanatorium facilities should provide for the ultimate accommodation of not less than one to three per thousand of the population of the community for which it is established. Obviously, no fixed figure will apply accurately to all. The estimate given does not apply to private pay institutions. Their capacity must depend upon the ability of their management to keep them filled. Patients who are able to go to pay sanatoria, and remain there the necessary time, are not considered suitable for admission to sanatoria provided by the community, to which the contents of this book are chiefly directed. Although it is possible to combine the elements of pay and charity in the sanatorium scheme, it presents many difficulties not encountered in combining these factors in a general hospital. Such a combination in the sanatorium, to be entirely successful, would probably have to be so arranged that the pay patients were accommodated in an entirely separate and independent unit. The two units could be under the direction of the same Resident Physician-in-Charge. In this case charges would be graduated according to accommodations and requirements. A combination of this character could enable a small city to provide for their needy tuberculous, whereas otherwise sufficient public funds might not be available. In such an organization the cost of land, construction, water supply, heating plant, sewage, storehouse, medical services and administration would be combined and reduced.

For many obvious reasons, no community either could or should construct and open a sanatorium at its ultimate desired capacity. Communities grow and the sanatoria must grow with them. Even in large, rich communities funds can only be secured gradually, as the need and worth of the institution are proven by its accomplishments. It is also well to have the medical, nursing and administrative staff accumulate experience with growth of the institution. Nevertheless, experience has taught that few factors in this work give more future difficulties than starting a sanatorium and locating the initial buildings without comprehensive consideration of future expansion and growth. The placing of each unit, as well as the location, capacity and design of every building, should be part of a rational foundation upon which the matured scheme will develop. All primary essential units should be originally placed in relation to each other and separated sufficiently to permit of economic administration and future expansion, without coming into too close proximity to each other. All buildings of common purpose, such as storehouse, staff house, dining halls, recreation pavilion, work shops, and the like, should be located and constructed so as to permit of future growth and additions. Principal buildings should all be so placed that they appear to good advantage and face upon a pleasant outlook. Roads should be located in reference to buildings, contour of ground, convenience of service and appearance. Unless there is an excess of shade, no good trees should be sacrificed or ignored in the plan.

Units.—A complete sanatorium, with a capacity of five hundred or more, to serve a community of five hundred thousand or more, should consist of five units: a *Reception* unit, a *Women's* unit, a *Men's* unit, a *Children's* unit, and an *Administration* unit.

Reception Unit.—To avoid disturbance of proper sanatorium conduct, standards and cheerfulness, the reception unit should be well away from the other units and near the entrance to the sanatorium grounds. It should be on a lower level than the other units, if the contour of ground permits. It should comprise an infirmary building, with a capacity of not less than ten per cent. of the entire sanatorium capacity; two reception shacks, with a capacity of about eight per cent. of the entire sanatorium; one small building, containing two isolation rooms, and one pavilion for nurses and help. The reception shacks (or pavilions), placed laterally about 100 feet from the infirmary, one on either side, should be connected therewith by a covered and protected walkway.

Men's Unit.—This unit should have a dining hall, an infirmary with a capacity of five per cent. of the capacity of the unit, offices and drug room, a house for toilets and baths, recreation building, germicide house, patients' shacks, work shops, school house (or school room in one of the buildings named), a garden and piggery.

Women's Unit.—This unit should have the same buildings as the men's unit, except that it should have a hennery instead of a piggery, and it need have no school house. It should be located well away from the men's unit, so that intercourse between patients of the two units may be easily avoided.

Children's Unit.—This unit should have a dining hall, patients' shacks, isolation shack (or pavilion) and school house. It should be in close proximity to or adjoining the women's unit. The school house in the children's unit should be so constructed that the (few) positive sputum cases among the children may be always separated from the negative ones.

The Administration Unit should be situated on the mean level of the other units and about an equal distance from them all, to facilitate promptness and economy in supply and administration. It should consist of storehouse, heating and lighting plant, laundry, bakery, cottage for Resident Physician-in-Charge, medical staff house, nurses' pavilion, cottage for the Superintendent and Supervising Orderly, stable and garage, and a chapel. The ice house, where the winters are cold enough to collect ice, should be on the shore of the ice pond, at a higher level than the rest of the sanatorium, if possible.

TABLE OF CONTENTS.

Tuberculosis Sanatorium—Five Units.

Reception Unit	Men's Unit	Women's Unit—Children's Unit		Administration Unit
Infirmary 2 Reception Shacks Isolation Pavilion Nurses' and Help's Pavilion	Dining Hall Infirmary Recreation Building Baths and Toilets Germicide House Shacks Work Shops School Garden Pigery	Dining Hall Infirmary Recreation Building Baths and Toilets Germicide House Shacks Work Shops Garden Henery	Dining Hall Shacks Isolation Pavilion School	Storehouse Heating and Lighting Plant Laundry Bakery Physician-in-Charge's Cottage Medical Staff House Nurses' and Help's Pavilion Superintendent's Cottage Supervising Orderly's Cottage Stable and Garage Chapel

NOTE—Roads, lawns, shrubbery, flowers, shade trees, water supply, sewage and ice pond and ice house, or ice plant must all be adjusted to the needs of the entire institution.

There often arises the need of a sanatorium of relatively small capacity. In such instances the number of buildings enumerated in the foregoing table can be greatly reduced, by intelligently combining the functions of the various components, so that even a single unit may give efficient service.

A sanatorium with a capacity of about 50 to 100 patients would best be confined to one unit. Here the necessary functions would be combined in five buildings, according to the following table:

TABLE OF CONTENTS.

Tuberculosis Sanatorium—One Unit.

Reception Pavilion	Men's and Boy's Shack	Women— Children's Shack	Dining Hall	Physician's Cottage
Two sides separated by solid wall Men's Ward Women's Ward Men's Infirmary Women's Infirmary 2 Isolation Rooms 2 Dressing Rooms Physician's Office Drug Room Laboratory Nurses' Apartment Orderly's Room Help's Room 2 Compartments in basement for Baths and Toilets	Two Sleeping Porches Compartment for Boys Dressing Rooms	Two Sleeping Porches Compartment for Children Dressing Rooms	Kitchen 2 Dining Rooms 2 Recreation Rooms with Library and Porches 2 Work Shops Laundry and Bakery	Cottage Stable Garage
Water supply, lighting and sewage disposal would have to be arranged according to the situation. Pigery, henery, gardens and flower beds could also be established in proportion to the institution's ability to maintain them.				

Acres.—No sanatorium should be built on less than ten acres of land. There should be at least one-tenth of an acre per patient, and preferably more, whatever the size and capacity of the institution.

Position of Buildings.—In most localities all which are occupied or used by patients should face south, southeast or southwest. These posi-

tions give the best protection against prevailing disagreeable winds, give the greatest amount of direct sunlight and the most pleasing outlook. In some rare instances the contour of the only ground available, or a peculiar direction of the prevailing winds, make it advisable, or even necessary, to have the buildings face east or west. In no part of the northern hemisphere should a shack, dining hall or recreation pavilion face north. In the southern hemisphere, where the sun's rays slant from north to south, the reverse is the case.

The positions of all buildings, in their relation to each other, should be given careful consideration. Generally speaking, all of those buildings of common use to the patients, such as dining hall, recreation and library building, bath and toilet house, and germicide house, should be located centrally and on an average mean level of the majority of the shacks. In this way the necessary daily walking or climbing of all patients is equalized as nearly as possible. All shacks must be located with due thought to this consideration. It is preferable to have all buildings one hundred feet, or more, apart, except the infirmary and dining hall, which should be about fifty feet apart. In no instance should sanatorium buildings be less than fifty feet apart. The infirmary (or reception pavilion, when it contains the infirmary) should be connected with the kitchen by a covered walk, for the convenience of service in bad weather.

When the sanatorium consists of but a single unit, for both sexes and all ages, the buildings should be so placed, symmetrically, that the sexes can be completely separated by a fence, wall or some sharp line of demarkation.

When there are separate units, the laundry building should be in that part of the administration unit which is nearest the women's unit; because much of the laundry work can be done by women patients. The Nurses' pavilion (or home) should also be near the women's unit. The medical staff house and supervising orderly's cottage should be near the men's unit. The Resident Physician-in-Charge's cottage should be midway between these two units. The heating and lighting plant should be on a level with the lowest building in the sanatorium, since this facilitates the distribution of heat. The henery and pigery should be at lower levels than the inhabited buildings.

Either separate units, or separate compartments in the buildings, can be arranged for negroes, in those localities where separation of the races is customary in all institutions.

Types of Construction.—All of those buildings which are, or contain equipment, necessary to the conduct and life of the entire unit or sanatorium should be fireproof, semi-fireproof or slow-burning construction. The extra cost of fireproof construction in such buildings as the storehouse, dining halls, infirmaries, heating and lighting plant, laundry, bakery, bath and toilet house, germicide house, recreation and library building and garage is fully justified from every point of view. It is also good economy to have the reception shacks of fireproof construction.

The great cost of initial construction alone, to provide sanatorium accommodation enough for large communities, is so stupendous that, if we are to even approach the needs, we must use the strictest economy

commensurate with good judgment. It is in the shacks (sleeping quarters of the active patients) that we can, with greatest safety, reduce the cost of construction to a minimum. Even here, however, parsimony often proves expensive in the long run. When deciding upon the kind of material and work to be put into even a shack, we must not lose sight of the cost of repairs and upkeep, which mounts rapidly in buildings thrown together hurriedly with material of poor quality. With the rapidly varying cost of material and labor, in modern times, it would be futile to name a definite figure in any money standard as a fair cost per bed for shacks. However, when, in 1910, we built shacks that filled every requirement for \$125 to \$400 per bed, at the Otisville sanatorium, it is safe to say that those institutions that cost, in construction, \$5,000 and more per bed were not serving the community in reasonable proportion to the money outlay. On the other hand, experience has taught us that the shacks we built at Otisville for \$90 to \$125 per bed were not good economy. They require repair almost constantly and have never given complete satisfaction. Shacks can be built of wood with reasonable economy and give satisfactory service and appearance. They should, however, be well built, on good foundations and of heavy, substantial and chosen lumber, to avoid the need of early and frequent repair.

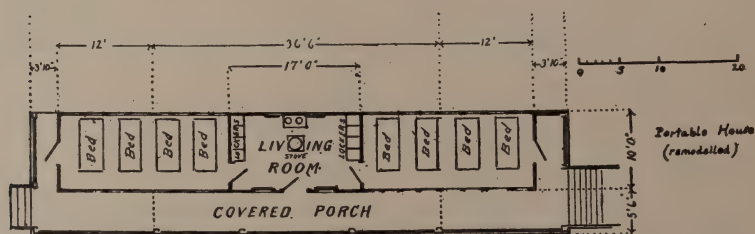
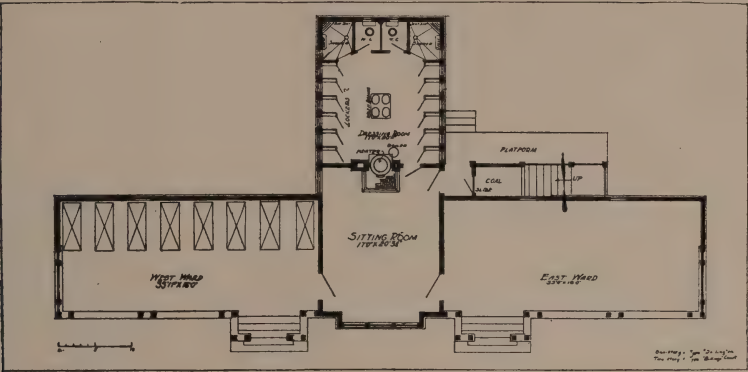


FIG. 6.—CONVERTED PORTABLE HOUSE; THE FIRST SHACK USED AT THE OTISVILLE SANATORIUM.

Plans and Essentials of Buildings.—The detail plans of individual buildings will naturally depend largely upon the contour of the ground and the choice of the architect and management. Yet there are some fundamental essentials and, in many instances, fixed arrangements which have been found best suited for convenience and efficiency. For instance, in spite of innumerable attempts to change and improve the shack plan, none has been evolved which is as good as the original basic plan of the King Lean-to (see Fig. 7); some minor details, for economy of space and privacy, have been devised and added to the basic idea of the King Lean-to, but that is as far as improvement has gone.

Infirmaries.—In the case of infirmaries, although they may be built to meet any architectural taste, there are some essentials that they must contain. A sleeping porch, or porches, which can be opened wide or closed at will, and isolation rooms are essentials. The infirmary in each unit should contain a small diet kitchen, besides being connected by a covered walk with the dining hall kitchen. It should contain a

nurses' record and drug room, physician's offices, examining room, surgical dressing room and dispensary. The latter should communicate directly with an outside porch or walk. This building should also contain orderly's quarters, bathing and toilet facilities. The infirmary building of the reception unit is the principal building of this unit



with space for two or more clerks, X-ray, clinical and experimental laboratories, morgue and autopsy room in the basement. This building should also contain a surgical operating room and an office for the dietitian. The plan must provide for complete separation of the sexes.

The Recreation Pavilion, with library space, admits of almost any type of architecture and arrangement, so long as all rooms and porches are provided with the maximum of air and light. Its porches should, of course, have the most attractive outlook available. It is well to have in this building a stage for dramatic exercises and any other formal services by or for the patients, and other special occasions. The recreation building should also contain space for a patients' store,



CONVERTED PORTABLE HOUSE, WITH OPEN SLEEPING PORCHES AT ENDS, USED WHEN MUNICIPAL SANATORIUM WAS OPENED IN 1906.

news stand and post office. The workshops may be provided for on the ground floor, or in the basement, if the ground contour is such that high ceilings, ample windows and air space is available, without raising the main floor too far above the ground at the main entrance.

Bath and Toilet Building.—A central building for baths (tubs and showers) and toilets, to accommodate all of those patients who are up and about the grounds, has many advantages. Such a building must be presided over by a reliable custodian, when open for use. In this way the patients' baths can be kept track of more accurately and the plumbing better cared for than when these facilities are scattered about the unit. the custodian would inspect every tub as soon as used and see that it was left clean for the next bather. Toilets and all plumbing fixtures are treated with more respect under some such close observation. In this

way it is possible to eliminate baths from the shacks and reduce the installation of toilet fixtures in the shacks to only that which is necessary for night and early morning use. It has been the experience in all sanatoria that the plumbing receives the roughest handling and has to be

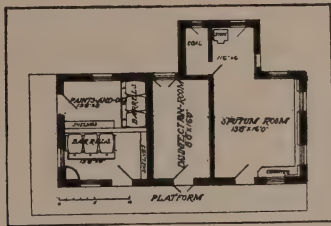


FIG. 8.—GERMICIDE HOUSE, FIREPROOF, OTISVILLE.

repaired oftenest in the shacks where no permanent custodian is in charge.

The Germicide House should have three compartments, all fireproof. One compartment, or protected porch, for the patients to occupy while having their sputum cups changed. A central compartment, light and airy, for

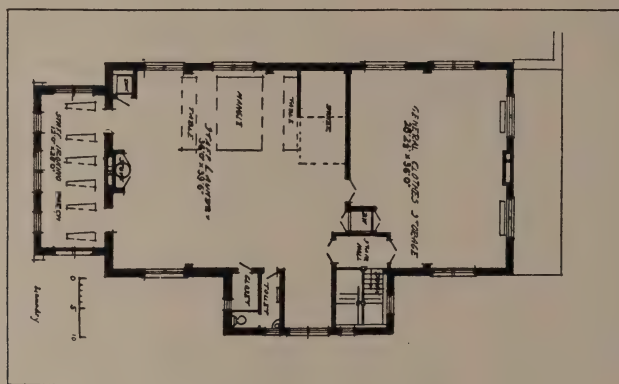
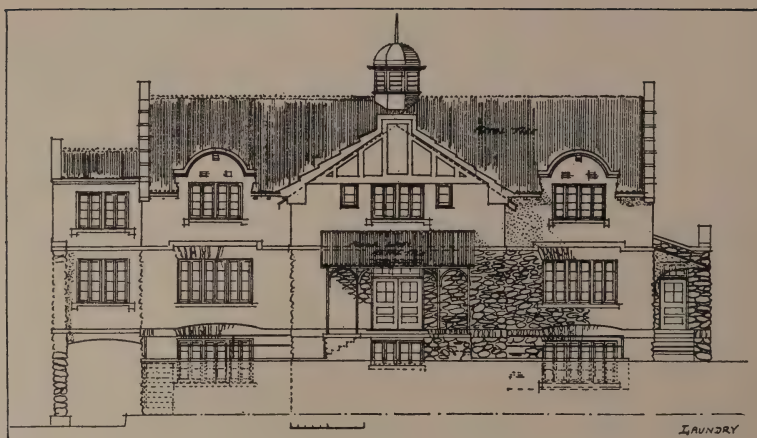


FIG. 9.—LAUNDRY, FIREPROOF, OTISVILLE.



FIG. 10.—TYPE OF SHACK WITH CONTINUOUS SLEEPING PORCH ACROSS ENTIRE FRONT (\$300 PER BED, PLUMBING, 1907), OTISVILLE.



FIG. 11.—CHILDREN'S SHACK, MUNICIPAL SANATORIUM, OTISVILLE.

the operator, contains shelves for the cups, table for changing fillers and disinfection work and the body of the incinerator. The ashes from the incinerator should discharge into a third compartment, which communicates only with the outside air, so that no dust or ashes can contaminate the other two (see Fig. 8).

The School houses, rooms or porches, which may be separate buildings or parts of other buildings, should be freely open for air.

The Store House, besides ample room for storage of all supplies, including cold storage, should contain offices for the superintendent and storekeeper and the central telephone switchboard and operators. This, as well as all other buildings, should be amply supplied with large windows,

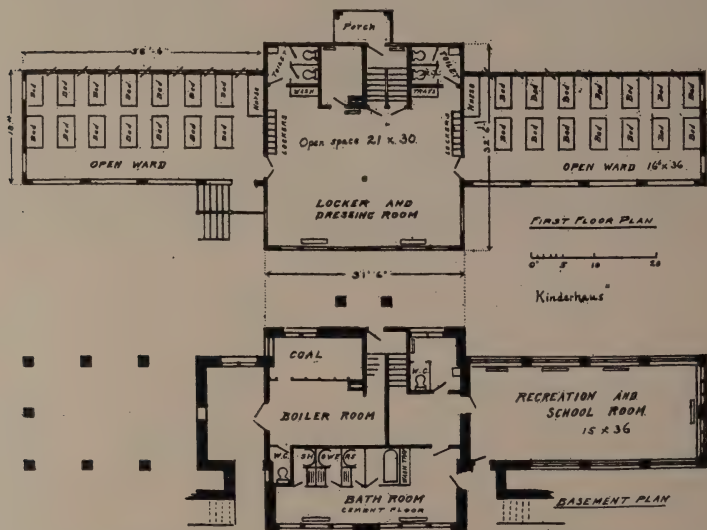
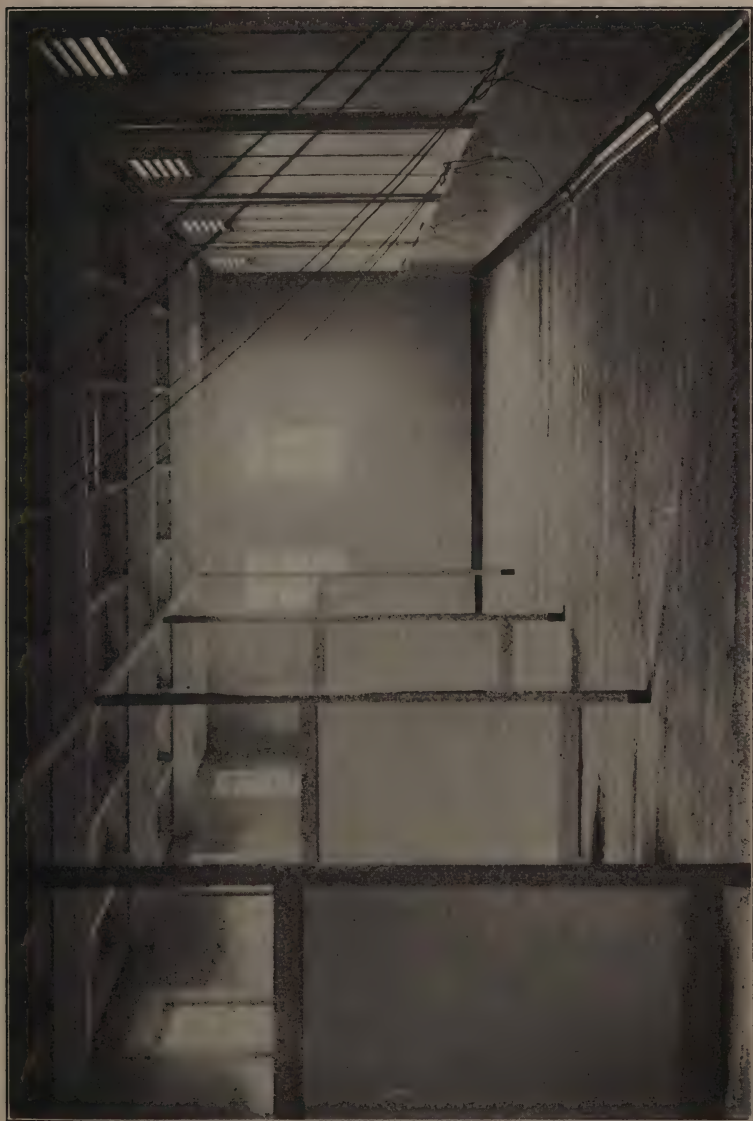


FIG. 11.—CHILDREN'S SHACK, TWO ROWS OF BEDS ON PORCHES, OTISVILLE (\$200 PER BED, PLUMBING, 1910).

so that as many patients as possible, with arrested disease, may be employed in them without injury to their health or to others.

The Laundry.—Those rooms that contain the mangle and where the ironing is done must be large and well supplied with large windows, for it is quite practical to have all this work done by patients. This not only does not injure properly chosen patients, but, like all carefully regulated work under medical observation and in good air, is a distinct benefit (see Fig. 9).

Shacks.—This term is applied to the patients' dormitories in a sanatorium. As previously stated, the arrangement which has stood the test of time with most satisfaction is a central compartment with lateral open porch wings (see Fig. 7). In this arrangement the central compartment has large low windows in front, which give an agreeable outlook, while, at the same time, it offers a protected sitting room for those times when the weather is too inclement to sit outside. This compartment



SLEEPING PORCH OF SHACK BUILT 1918, MUNICIPAL SANATORIUM, OTISVILLE, N. Y.

This shows the incomplete partitions which increase the bed capacity and add to privacy. The storm shutters, with hinges above, are lowered, to right, closing in the porch. The ventilation openings in these shutters with sloping slats were suggested by Mr. Crane at Otisville. When the shutters are drawn up flat against the ceiling, as they are at all times except during severe storms, the porch is entirely open to the south.

extends back beyond the lateral wings, to contain the lockers, lavatories and toilets, and serves as a dressing room. There should be a partial partition between sitting room and dressing room. The latter can be kept warm while the sitting room is flooded with fresh air. The lateral wings, or sleeping porches, are entirely open the full length of their front, with a railing of solid paneling, about two and a half feet high, protecting the margin of the porch. There should be hinged screening of some sort to close this space during very violent storms. There are shacks in use with the sleeping porch extending entirely across in front of the central space (see Fig. 10). This building accommodates boys at the Otisville sanatorium. It was an experiment which developed no advantages and has many disadvantages. Figure 11 is a children's shack at Otisville.



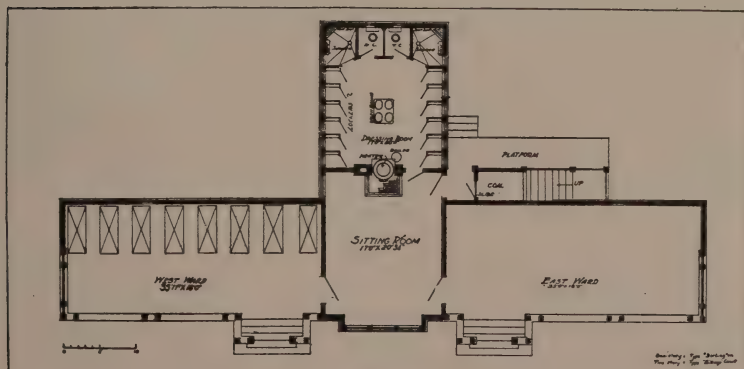
FIG. 12.—TWO-STORY SHACK, ON MODIFIED PLAN OF KING LEAN-TO, OTISVILLE.

Here the porch is deep enough to accommodate two rows of beds, an element of economy, of doubtful virtue.

The desirable capacity of the shacks is a question which deserves consideration. They should not be all of a uniform capacity. One of the most important aids to success in the conduct of a sanatorium is having the patients assigned to shacks in companionable groups. This is accomplished by considering the personal and racial characteristics of the individual patients, as well as the stage of their disease. It is, therefore, apparent that these various influences will divide them into groups of widely varying numbers. To accommodate these groups we must have shacks of various capacities. The sleeping porches should never hold more than ten or twelve patients on a side on one floor. More than



Note. It will be observed that the side elevation is shown on about double the scale of the front elevation.



twenty or twenty-four patients cause too much congestion in any one dressing room. Shacks may be built with two floors (see Fig. 12), so as to accommodate forty or forty-eight patients, but never more than two

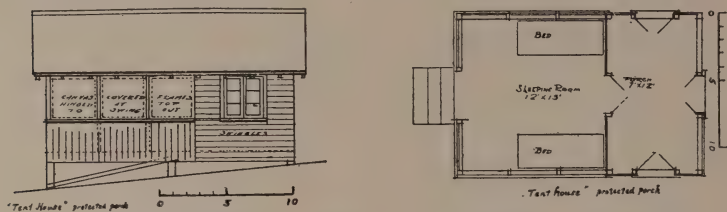


FIG. 13.—TWO-PATIENT SHACK, NO PLUMBING, OTISVILLE.

stories, because this would necessitate too much step climbing for some patients. There is, of course, economy in two-story shacks, since one

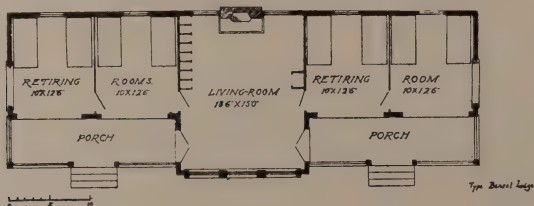


FIG. 14.—EIGHT-PATIENT SHACK, INCOMPLETE PARTITIONS ON PORCHES (\$200 PER BED, PLUMBING, 1908), OTISVILLE.

foundation and one roof provides for twice as many beds as the same space in a one-story shack. It is best to have in every large sanatorium shacks to accommodate from two to forty or forty-eight patients each,

to accomplish the pleasantest possible grouping of patients. As far as is possible, the sputum negative cases should be housed in separate shacks from the positive cases.

Tents, or ten houses, with canvas covering the sleeping porch in front and a frame dressing room at the rear, have been used for two-patient shacks. The canvas has been found to decay and become deranged so soon, when the appearance becomes unattractive, that the slightly greater cost of building it entirely of wood is more than compensated for

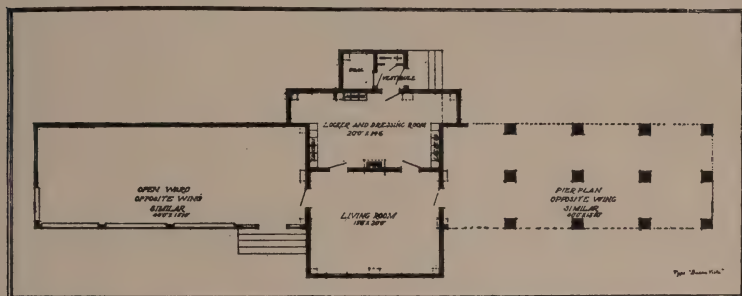


FIG. 15.—SHACK FOR 20 PATIENTS, NO PLUMBING. BUILT FOR \$110 PER BED (1908). OTISVILLE.

in service and appearance. If there is a central heating plant these small houses can be placed along the course of a steam main and heated by radiators. Figure 13 illustrates a very satisfactory two-patient shack, which has given good service and been much sought after by the patients in the Otisville sanatorium since 1910. At Otisville these little houses are heated in winter by small coal stoves; they have no running water or toilet facilities in them. The patients use the toilets in nearby buildings. Every sanatorium of considerable size should have from three to five two-patient shacks, in order to happily house those few patients of

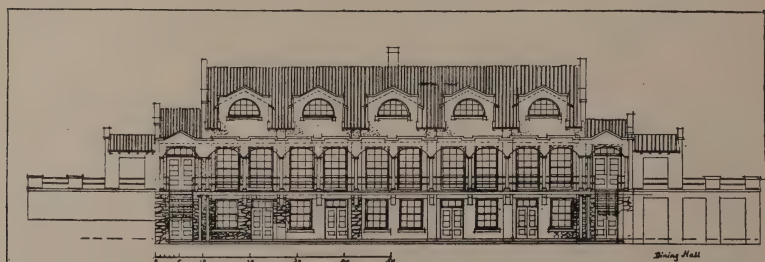
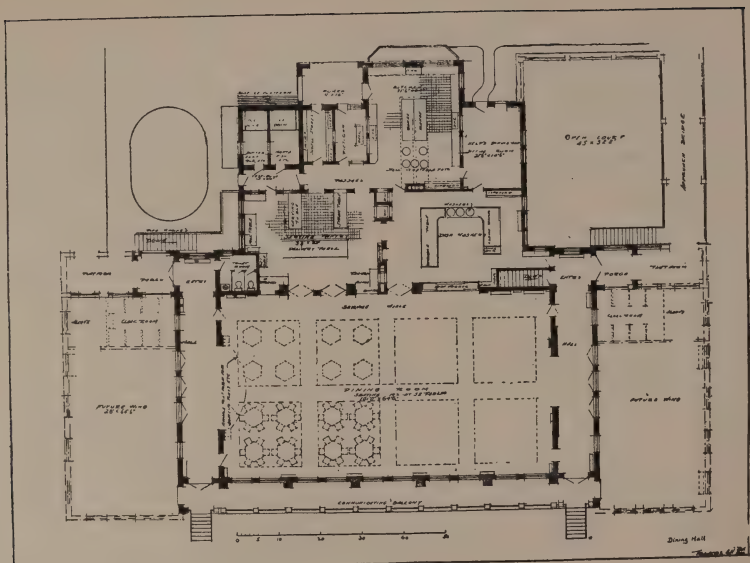


FIG. 16.—WOMEN'S DINING HALL, CAPACITY 192, OFFICES IN BASEMENT, FIREPROOF (COST, \$40,000, 1912), OTISVILLE.

peculiar personalities who will not fit well in a larger group. Too many of such buildings would be expensive and inexpedient. Figure 14 is an eight-patient shack at Otisville. The partitions shown between the two central beds on each porch are incomplete. They begin one foot from the floor and extend up six feet above the floor. This gives privacy, good ventilation and increases the bed capacity.

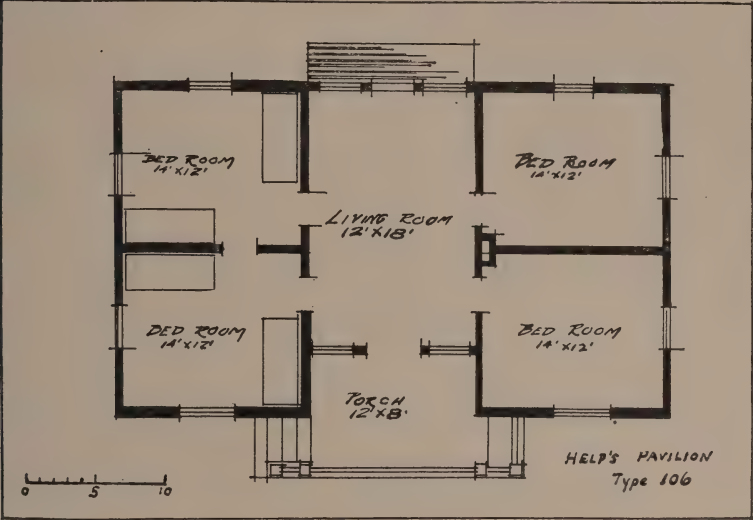


FIG. 17.—HELP SHACK, OTISVILLE.

CHAPTER IV.

ADMINISTRATION AND STAFF.

The Administration.—When a tuberculosis sanatorium is administered by one of the State's or City's large departments, it falls naturally under the Department of Health. It is the function of a Department of Health to direct all activities and disseminate knowledge, for the control and prevention of disease. It is the Department of Health that collects and records data concerning existing cases of infectious diseases including tuberculosis. Therefore, since the least friction and most effective control of these cases is desired, it is clear that the selection of patients and conduct of the sanatorium must be functions of this department. Furthermore, the more direct and unified the control of this work, the more economical will be its execution.

Unquestionably the most potent influence in preventing the spread of tuberculosis is the practical education and training of ambulant cases in preventive measure. Certainly there is no other agency comparable to the sanatorium in accomplishing this education and training. In fact, this is an important part of sanatorium treatment; they can not be divorced, since proper care of the patients necessitates constant application of the most intelligent methods of control and destruction of their infective discharges. Since no one can tell when a definitely clinical case, whose sputum is negative, will have tubercle bacilli in their sputum, they must and do receive the same education and training, in sanatorium, as the sputum positive cases. The sanatorium also aids in segregation of the sputum positive cases.

In view of the above it is obvious that a Department of Health which does not possess and direct a tuberculosis sanatorium, for the care and instruction of those patients who will return as active members of the community, is deprived of the most effective instrument for the prevention of tuberculosis, the most deadly of all infectious diseases.

The Staff.—Whether a sanatorium reaches or does not reach the highest and finest standards in its services to those who enter its confines, for aid and guidance in their fight against that little bacillus, whose armor plate or capsule of fat is impervious to even nitric acid, depends most of all upon the calibre, tact, sincerity and energy of the resident staff of physicians, nurses and orderlies. It is not enough that the staff shall know and apply all scientific knowledge developed concerning the cause, treatment and control of tuberculosis; they must also establish and maintain an atmosphere of personal confidence, acquiescence, cheerfulness and hope, which should pervade the entire institution. Co-operation in its truest sense must exist, not only between all employees, it must exist between the employees and the patients, individually and collectively. Each patient must feel a confidence born of the knowledge that his every pleasure and pain, joy and sorrow, are of genuine interest to his physician. He must feel free to talk to his physician or his nurse about his every anxiety and interest, whether they concern his own bodily condi-

tion or some responsibility he has left at home. The fight is so long and bears so harshly upon so many of life's circumstances and ambitions that the human side, the lasting friendly influence of the sanatorium staff upon the patients very often determines the permanency of their recovery after leaving the institution. No matter how competent the staff, there will inevitably be some patients who will not improve, some who grow worse and some who must die in the sanatorium. In these cases the staff, from the visiting physician down to the orderly, can at least remember that what they do for these is proportionately greater than anything done for those who win their battle; for this is all their lives contain. They must never be permitted to glean, from the slightest act, word or omitted service by any of the staff, that they have become an unwelcome burden. Every worker in a tuberculosis sanatorium, more than anywhere else in life, needs to ask himself or herself frequently the question: "Suppose I were this patient?"

First and foremost in these influences is, naturally, the Resident Physician-in-Charge; for it is he, more than anyone else, who inspires the rest of the staff. There is probably no more difficult task that one could attempt than to specify the qualifications and characteristics necessary for one to possess in order to attain success in any undertaking. Character, personality, charm, magnetism, sincerity, energy, determination, poise, knowledge and experience all enter into the necessary composite picture. Dominating all of the foregoing is that subtle something which can be best characterized as a capacity to succeed. Whether a man possesses this quality for a given undertaking can never be foretold. However, there are some points in the training and experience of a physician which favor, and some which are natural obstacles to, success as a Resident Physician-in-Charge. The latter (obstacles), though more definite than the qualities essential for success, may be overcome by an adaptable character with ample determination. To grasp the significance of those characteristics which are undesirable in a sanatorium physician, it is necessary to recognize the differences that exist between conditions in a general hospital and those in a sanatorium. They can not both be conducted successfully with the same point of view. In fact, the longer and greater has been a physician's success in the conduct of hospitals, for acute diseases or for the insane, the greater will be the likelihood of his failure when put in charge of a tuberculosis sanatorium. On the other hand, one whose medical experience has been exclusively with tuberculosis is equally handicapped. The following are favorable: A physician of good moral character and temperate habits, who has had one to three years internship in a general hospital and has practiced his profession, with reasonable success for several years, has had several years experience in outdoor clinics for tuberculosis, some familiarity with the conduct of sanatoria and a wide knowledge of people.

Besides the Resident Physician-in-Charge there should be two Resident Physicians, one in charge of the men's unit and one in charge of the women's and children's unit. The number of the medical staff, in addition to the three mentioned must depend upon the number of patients in the sanatorium. To properly care for the patients, keep up

scientific standards and return good results to the community, there should be one physician on the resident staff to every fifty patients. With this number the educational work and influence of the institution can be kept at a high level. This is an important item, as every tuberculosis sanatorium should be a source of education for patients, nurses and physicians. Physicians with arrested lung disease often make very satisfactory members of a sanatorium staff, so it is good policy to appoint these men on the staff when they are available and otherwise suitable.

In large sanatoria one member of the medical staff should be trained in the examination and treatment of the ear, nose and throat. One should have special education and training in bacteriology and serum therapy. Another should be experienced in the proper performance of autopsies and have special knowledge of gross and microscopical pathology, and one should be experienced in the use of the X-ray. In such institutions there should also be a resident dentist.

The Visiting Physician, who must be peculiarly conversant with this branch of medicine, should visit the sanatorium once or twice a month. Besides exercising the functions common to visiting physicians in any hospital, his visits keep up a wholesome contact between the resident staff with the world at large, as well as with the general medical profession. It is also his duty to stimulate and encourage, in his resident staff, interest and work in the advancement of scientific knowledge of tuberculosis.

In the cases of small sanatoria, with fifty beds or less, the Resident Physician could combine his sanatorium duties with private practice in the immediate neighborhood.

Nurse.—There must be one supervising nurse, who can also act as matron. The supervising nurse should be experienced in the direction of nursing in such institutions. She must also be educated and experienced in general social welfare work and the care of tuberculosis in private homes. In addition there should be one trained nurse to every one hundred (100) patients. If discharged patients are to be followed up directly by the sanatorium, which is in many ways desirable, two additional nurses should be on the staff. Most of these nurses could receive all of their training in the sanatorium. It would, of course, be necessary to have previously trained nurses when the institution is first opened. Later on, as the census increases a nurses' training school can be established and conducted in the sanatorium by the sanatorium staff. The graduates of this school would fill vacancies as they occurred in the local staff and also nurse tuberculous patients elsewhere.

In addition to the graduate trained nurses there should be one competent and specially trained woman to care for every twenty (20) children in the children's unit. These women could be trained in the sanatorium.

There must be five or six special trained orderlies in a large sanatorium. At least three for day duty and two for night. The orderly in charge of the men's reception pavilion (or shack) can be on twenty-four hour duty, since practically all of his work can be done in the daytime. All of these men can be trained in the sanatorium.

The trained nurses, children's nurses and orderlies should consist as largely as possible of patients (or ex-patients) in good general physique, whose disease is arrested. The policy of encouraging appropriate patients to enter these employments has many advantages for both the patients and the sanatorium, as well as for the community. It has been found that such employees are usually the most contented and devoted. There has been some discussion concerning the fairness of applying a lower scale of pay to this class of employees than is paid to those who have never had clinical tuberculosis. It is claimed by some that it is unfair to take advantage of their misfortune. Others contend that their continuance under the regime of the sanatorium should be considered part of their compensation. These also claim that their usefulness is largely peculiar to the institution in which they work. Yet, it seems to the author, that this very familiarity with their peculiar duties renders them just so much more valuable to the sanatorium, and certainly justifies paying them as much as is paid to non-tuberculous persons for similar work. It must be understood that any work done by patients in their necessary period of treatment is primarily a therapeutic measure, although it serves economy for the administration and is never to be paid for by a money wage.

The considerable saving in payroll by using therapeutic exercise, in the performance of necessary work in the sanatorium, certainly justifies the payment of equal wages to tuberculous and non-tuberculous employees. The rather more frequent sick leave, or lightened responsibilities, arising in those with arrested disease, is well compensated for by the great volume of work performed by patients without wage. However, most persons who have regained their health in the sanatorium are so grateful for the ability to again earn a living that they do not care to demand a rigid financial reckoning. The following principles should govern this situation: Those tuberculous employees who are in every way competent should be paid the same as those who, so far as is known, are non-tuberculous. Those whose lung conditions or general vitality necessitate special consideration or shorter hours of work than the average, or who can not do so much or as good work as non-tuberculous employees in similar positions, should be paid less wages, in proportion to the quality and volume of services rendered. There are some positions where the work must be up to a definite standard in quality and volume, such as nurse and orderly. These should be filled only by those who are in every way competent.

The Supervising Orderly is responsible for the execution of the physician's orders concerning patients' exercise and work, as well as care of the shacks and grounds. He is not in charge of the four or five orderlies, previously mentioned, who are employed in the infirmaries and reception pavilion. The latter are under the immediate direction of physicians and nurses.

The Superintendent has charge of building, equipment and supplies, under the direction of the Resident Physician-in-Charge. He should have education, knowledge and experience in building construction and allied subjects. The duties of the superintendent and resident physicians-in-

charge blend at so many points that amicable co-operation between these two officials is peculiarly essential.

Housing Staff.—In order to acquire and retain a competent staff the housing provided for these employees must be appropriate, comfortable and complete. When we consider that these people should possess rare personal qualities, good education and lofty standards, if we expect them to be contented in such relatively isolated conditions, the necessity of providing them with attractive homes is at once apparent. Contentment, always important, is peculiarly vital in a tuberculosis sanatorium. The Resident Physician-in-Charge of a large sanatorium should be a man on a level with the most successful practitioners. He must command the respect of, not only the patients, but also the rest of the staff. To do this his house, at the sanatorium, must be commensurate with the dignity expected of him. He is of vital importance to the welfare of the institution and should be equipped accordingly. The housing of all other members of the staff must be appropriate and comfortable. The staff house, which is for the housing of all physicians except the Resident Physician-in-Charge, should contain an ample library room for regular medical or clinical conferences, which should be attended by all the resident medical staff and any guests that may be invited.

The compensation of various members of the staff must be such as will command the best quality and talent available. Without compensation which compares favorably with that paid by similar institutions no sanatorium can hope to secure and retain men and women of ability and high standards, without which all other expenditures are futile.

CHAPTER V.

FURNISHINGS AND EQUIPMENT.

The requirements to be met in furnishing a tuberculosis sanatorium are, in many details, common to all hospitals and sanatoria, but the problem here has some peculiarities which should be considered.

The sanatorium should be furnished throughout as simply and economically as will meet the limited requirements. It must be kept in mind that a maximum of outdoor life is desired, so that no exercise of attractiveness in indoor furnishings is needed. The average patient needs only two sputum cups, a chair, a bed, a table and a locker. The most satisfactory lockers are those which are built in as part of the dressing room of the shacks. The best sputum cup is a square tin box, with small handle and hinged cover, to hold impervious paper fillers. One of these cups is always in the germicide house, being sterilized and refilled, while the patient is using his other one. He must always carry his sputum cup, except while at meals.

The best bed is of iron, enameled white, with wooden or rubber castors, or the patent easy gliding discs, so as not to scratch the floor. The patients can re-enamel these beds as frequently as need be. Only the infirmary beds, upon which the bed-ridden must be cared for, need be higher than an average bed. The plainer the lines of a sanatorium

bed the better. A woven or linked wire spring gives good service. There is no economy in having them flimsy and cheap. The mattress should be of felt or hair and of fair thickness where the climate is cold in winter. Two double woolen (or mostly of wool) blankets of light color must be on each bed, besides one rough mixed blanket of dark color, to be kept rolled at the foot of the bed. This rough blanket is for covering when the patient is lounging on the bed or in a chair in the day time, as well as for extra covering when the nights are very cold. Cotton "flannel" sheets are necessary when the nights are cold. During cold weather every



INFIRMARY WARD, MUNICIPAL SANATORIUM, OTISVILLE.

patient should be instructed, shortly after their arrival, in how to make the Klondike bed. Other bed clothes are in no way peculiar.

The bedside table, one for each bed, should be simple white enameled iron, with glass top. Each patient should have a chair of the lounging variety. It should be something like a steamer deck chair and made of strong light wood. Iron lounging chairs are too heavy and difficult to move and adjust.

The dining room tables and chairs should be of the simplest construction with straight lines. In fact, economy and durability should be the key notes, with attractiveness of secondary importance, except where the

serving of food is involved, in all interior furnishings. It is the outdoors, the open air, that must be made attractive.

In the recreation building there should be some comfortable easy chairs and settees, for rainy and otherwise stormy days, when the patients cannot be out.

The infirmary must be supplied with bed trays or tray holders for the bed patients.

In a large sanatorium the surgical operating room must be equipped with an operating table, glass top instrument and dressing tables, instrument case, sterilizer, instruments and supplies for all minor and the common major operations. No duplication of instruments need be provided. Instruments for treatment and the commoner operations upon the nose, throat and ear should be on hand. These should be in a separate (nose and throat) room. Here also duplication of instruments for similar work is an extravagance which should be avoided. The elaborate electrical pumps for sinus work do more harm than good in most tuberculous patients. The dental room must be properly equipped.



CHICKENS, RAISED BY PATIENTS, MUNICIPAL SANATORIUM, OTISVILLE.

In furnishings, as in construction and all other matters, the strictest economy must be practiced, if we are to provide accommodation for the great number of tuberculosis persons who need sanatorium treatment.

The Resident Physician-in-Charge must be provided with a horse and buggy, or automobile, to insure his constant personal direction of all parts of the sanatorium. There must also be means of local transportation for supplies and employees, as occasion demands.

The furnishings of the kitchens should be modern and of good quality; such as will encourage economy and nicety of service. The dietitian should be consulted in making the selection of this equipment, matters in which she must be well versed, as well as in table service for the dining halls.

When new or additional furnishings are to be bought, as well as when new additional construction is contemplated, it is the best policy to consult, and give weight to, the opinions of those employees who have devoted their time and attention to the use of these things in the sanatorium. Many blunders and much waste can be avoided in this way.

Books, newspapers and periodicals can often be largely supplied for the patients' library by charitable friends and societies.

Physician's offices, record rooms and drug rooms must be equipped and furnished in accordance with the usual requirements of such places.

The clinical and diagnosis laboratory should be equipped fully, with up-to-date apparatus, for diagnosis in chemical and bacteriological lines. There should also be a proper incubator and attachments, with other necessary facilities for research work by the staff. The X-ray laboratory must be supplied with complete modern equipment.

There should be in the library, or conference room of the medical staff house, a medical library, including representative medical journals and a projecting lantern for negatives and pictures.

Lawn furniture and the outdoor games which the patients are permitted to play should be provided for.

The essential modern equipment for the comfort and pleasure of the patients, as well as for the encouragement of study and research by the staff, is good investment for the community.

CHAPTER VI.

SELECTION OF PATIENTS.

At the time, or shortly before, a tuberculosis sanatorium is opened for patients, the authorities in charge of the institution should, by appropriate means, inform the medical profession and the public concerning it. The lay press should be given the salient facts and objects of the sanatorium for publication. A prospectus, setting forth the physical facts, the capacity, the class of patients acceptable and the cost to those who enter the pay unit, if it is not all charity, should be printed. It should be distributed to every physician, hospital, clinic and welfare agency in the community. At the earliest convenient moment the Resident Physician-in-Charge should read before the local medical society, setting forth the objects of the sanatorium. By these means an ample number of applicants will appear from whom the patients must be selected.

If there is no provision for the reception of pay patients, it does not necessarily follow that every one selected should be entirely without means. The proper sanatorium treatment of tuberculosis consumes a long time; from three or four months to a year or more. So that one must have considerable means to meet the expense of a pay institution. Therefore, if the line of pecuniary dependency were drawn too sharply in the selection of patients, a very great number of most worthy people would be deprived of sanatorium treatment early, when the disease is most susceptible to arrest and before they have spent their last penny.

It is a fact that, in the average community, not one person in one hundred who apply for admission to a charity sanatorium have means to enter and receive treatment in a pay institution. Too strict an investigation of the applicants along this line not only does little or no good, it drives away a certain number who should be admitted, but whose timidity makes them shun the implication of trying to impose upon charity.

The Examiner.—No doubt the best results will be obtained when the final examination for the selection of patients is performed by either a regular visiting physician to the sanatorium or the Resident Physician-in-Charge. These men are most likely to know what class of patients are best suited to the sanatorium's available accommodation at any given time. The examinations can be done on two or three days each week, between set hours. Differences of opinion concerning the suitability of patients and classifications, which often arise between the examining physician and the resident staff, would be avoided when a member of the staff does the examining.

Primary Factors Governing Selection.—The factors to be considered in the selection of patients for a sanatorium may be arranged under three headings, as follows :

- (A) The community's or City's point of view,
- (B) Those factors relating to the welfare of the sanatorium,
- (C) Those factors relating to the individual patient who is, or should be an applicant for admission.

A—*The Community or City's point of view* must temper the general rules applied in the choice of patients for a sanatorium. Since the institution is provided, wholly or in part, at the expense of the community, it is obvious that its patients should be chosen along lines calculated to return the greatest possible good to the community. Fortunately the community's, the sanatorium's and the patient's welfare coincide so nearly that the same general rules conserve the best interests of all. It is to the community's advantage to have the disease arrested in every case possible, so it is to the individual and the sanatorium. Their best interests are also served by having this condition remain as permanent as possible. The permanency of the arrest depends largely upon how well the educational influence of the institution is applied by the patient after he or she leaves the sanatorium. In fact, one of the most important features of sanatorium treatment is the education of its patients upon self-care and the prevention or control of tuberculosis. It should disseminate knowledge upon this subject among the people through the medium of its discharged patients. Therefore, it is important that the patients selected be of the highest possible standard of intelligence and personal desirability commensurate with fairness to the community's poor. In many cases, too far advanced to offer a strong probability of arrest of the disease, yet not hopeless, sanatorium treatment may bring about improvement and a restoration of the general health and teach them how to preserve their health, as well as protect those about them from infection after they leave the sanatorium. The community interest also demands that the sanatorium segregate a fair percentage of sputum positive cases. It is perfectly true that any clinical case of tuberculosis, though no tubercle bacilli be discovered in the sputum, may at any time and without anyone's knowledge become positive. So that every case of tuberculosis is a latent source of danger to others. Yet the sputum positive cases are far the greatest source of danger, when at large, uninstructed and uncontrolled. And

every sanatorium which depends, even in part, upon public funds should have at least fifty per cent. of its admissions sputum positive.

Since boys and girls, fourteen years of age and under, who are admitted to the sanatorium run such a low average of sputum positives, it is necessary to have the positives in adults much above 50 per cent. (65 per cent. to 80 per cent.) to keep the general average up to 50 per cent.

The hopefulness with which a patient goes to the sanatorium and the maintenance of this hope is a valuable aid in the accomplishment of recovery or improvement. In order to retain its reputation as a curing institution, which is of actual therapeutic value, the percentage of early or hopeful cases admitted must always dominate. Since the sputum is negative in a considerable percentage of this class of patients, a sanatorium which accommodates a number of children will always have an average of not less than 40 or fifty per cent. of sputum negative cases in its general census. If there are no patients less than fourteen years of age, the sputum negatives should be not more than 20 or 30 per cent.

The following table of results in sputum examinations at the Municipal Sanatorium, Otisville, N. Y., for the week ending March 16th, 1918, gives a fair idea of the relative differences between ages and sexes, with respect to the usual sputum findings in such institutions:

<i>Male Patients Over 14 Years of Age.</i>		<i>Male Patients, 14 Years and Under.</i>	
Positive	174	Positives	0
Negative	80	Negatives	20
Percentage of Positives—68.51.		Percentage of Positives—0.	
<i>Female Patients over 14 Years.</i>		<i>Female Patients, 14 Years and Under.</i>	
Positive	107	Positive	2
Negative	88	Negative	56
Percentage of Positives—54.88.		Percentage of Positives—3.45.	
Average Positives of all Patients, 14 years of age and over.....		64.81%	
Average Positives of all Patients, under 14 years of age.....		2.57%	
Average Positives of all Patients, all ages combined.....		52.87%	

As indicated in the above tables, only about two and a half per cent. of selected children have bacilli demonstrable in their sputum by ordinary means. In view of this and the difficulty in obtaining sputum for examination, we should ignore negative findings when selecting these little patients.

B—*Those Factors Relating to the Welfare of the Sanatorium.*—Here, also, when selecting patients, we must remember that a sanatorium cannot be compared with a general hospital. Successful administration of the two institutions rests upon entirely different conditions and rules of conduct. In no other feature is this difference more marked than in the class of patients which should be admitted. The general conditions existing in a community sanatorium are nearly similar to those found in a small colony. The patients in a sanatorium do not feel sick, they are up and moving about and there is ample opportunity for them to become involved in the disputes and disturbances to which members of a small community are liable. In a hospital the “tough” or objectionable character is sick, he is constantly being waited upon, everything is done for him and he is not expected to perform any service himself. In the sanatorium the same man is not sick, he is not waited upon in small things, but, on the contrary, he is required to perform definite work. To him the situation appears

completely reversed; his disease becomes insignificant in his estimation; he loses sight of all benefits he receives from the sanatorium, and enormously overestimates the services he renders to the sanatorium. In his eyes he is the giver (always unwilling). Therefore, he feels justified in attempting to dictate and gives full sway to all his vicious tendencies. He thus becomes a bad influence, which works incalculable harm to the general discipline. Therefore, such a person should not be admitted, if it is possible to learn his character at the time of selection. If his objectionable qualities are discovered after his admission, he must be discharged. Just as one misshapen stone will destroy the form and strength of an arch, so will one vicious patient in a sanatorium upset the general conduct and impair the usefulness of the institution.

Different Races.—The relative percentage of the different races which compose the patient body must be given consideration. In a sanatorium supported by a community of mixed races fairness obviously dictates that the proportion of the different races among its patients should be more or less the same as in the community at large, unless tuberculosis happens to be much more prevalent in one race. In some communities it is neither desirable nor possible to house and feed white and negro races together. In such localities, when the sanatorium is small, these two races can be separated by complete partitions in shacks, wards, dining halls, dressing rooms, porches, recreation rooms and lawns. When the community is large enough it is preferable to have an entirely separate sanatorium or unit for negroes. In such instances the amount of accommodation provided for each race must depend upon the conditions obtaining in the community involved.

Ability to Work.—When the sanatorium is established and conducted with the intention of making double use of patient labor, therapeutic and economic, as the writer thinks all community sanatoria should be, some consideration must be given to the average of bodily strength in the patients selected. Since the desired average is maintained very well by adhering to other points that render applicants acceptable, only slight attention need be given to this feature. However, it is obvious that a very large percentage of young children, or very ill patients, would not leave enough able to work. Keeping the buildings clean and in order, waiting upon tables and attending to the lawns is certainly the minimum of work that should be done by patients.

C—These Factors Relating to the Individual Patient, who is or should be an applicant for admission. Primarily, of course, one should endeavor to admit only patients who have clinical tuberculosis, except in young children, where adherence to this standard is impossible.

Children.—The extreme rarity of characteristic physical signs and the difficulty in obtaining sputum for examination, in children under fourteen years of age, render a conclusive diagnosis impossible in the majority of suspected cases. In these applicants tuberculin tests and X-ray findings usually add confusion, rather than lucidity, to an already doubtful situation. Distinct dullness on percussion is rarely found in very young children, except over pneumonia or empyema. In fact, characteristic

physical signs are so rare in tuberculosis of very young children that marked physical evidences of lung consolidation, bronchial or pleuritic inflammation, in them points strongly to some other infection. The frequency of such symptoms as cough, elevation of temperature, loss of weight, palpable cervical glands and even rales in the lower lobes, due to acute infection or digestive disturbance, leads to a high percentage of incorrect diagnoses in children. However, these little sufferers are, at such times, very susceptible to tuberculous infection or activation of any latent lesion they may have. It is also a fact that practically all such children are benefited by sanatorium treatment and are less likely to be infected in a properly conducted sanatorium than under average outside exposure. Therefore, when history of exposure and symptoms indicate a probability of tuberculosis, even though no physical signs or tubercle bacilli can be found, they should be admitted to the sanatorium. The decision of their fitness or unfitness must be decided upon broad grounds. The presence of an active case in their home, or otherwise bad home surroundings indicate the advisability of accepting them. In a very large percentage of children the sanatorium must fill the role of preventorium.

In children who do not raise a sputum, smears taken directly from the larynx may be stained. In some cases bacilli have been found by this means, thus clearing up an otherwise doubtful diagnosis.

Children, under fourteen years of age, with persistent cough, when no cause can be discovered in the throat or naso-pharynx, if their home is unsanitary or other members of their family have tuberculosis, should be accepted. Any child who is poorly nourished or has large lymphatic glands, with such home and family history, is a suitable case. In the absence of other known cause, persistent elevation of temperature is enough to justify us in accepting a child from such a home. On the other hand, a well nourished child, with no blood or bacilli in the sputum of laryngeal smears, with good home conditions and no history of exposure, should not be admitted to a sanatorium, no matter what the symptoms or signs, tuberculin test or X-ray findings.

Any applicant for admission to a sanatorium, child or adult, of good character and not too ill or with serious complication, who has tubercle bacilli in their sputum or hemoptysis, not due to other discoverable cause, should be admitted. All children under fourteen years of age, with bad home surroundings, and who are suspected of having tuberculosis, but are not too ill to be properly cared for in a sanatorium, should be admitted.

The following symptoms, when not due to any other known cause, may be of tuberculous origin in children:

Hemoptysis.	Loss of, or failure to gain, weight.
Palor, or cold extremities.	Large, palpable lymph nodes.
Persistent evening temperature, $99\frac{1}{2}$ F., or higher.	Sweating on cool nights.
Cough for one month or longer.	Prolonged loss of appetite.
Dyspnoea on moderate exertion.	Pain in chest, repeated or persistent, in the same area.
Physical signs in upper lobes, very rare.	

When to three or more of the above are added a history of prolonged or intimate exposure to a known case of tuberculosis, if the patient is a child, a positive diagnosis should be made. An erroneous positive diagnosis here does not work the same injustice that it does in adults, especially young adults.

Diagnosis in Adults.—Every sanatorium in the world probably contains at least a small percentage of adult patients who are not affected with tuberculosis, certainly not clinical tuberculosis. This is unavoidable, since the selection of patients often involves the early diagnosis of tuberculosis, which is so frequently a matter of individual judgment. The demonstration of tubercle bacilli is not always necessary to make a fairly reliable positive diagnosis, but the diagnosis remains uncertain in many cases, so long as the bacillus cannot be demonstrated in the sputum.

When examining applicants for admission to a tuberculosis sanatorium, the diagnosis must be both qualitative and quantitative. Where most infectious diseases are involved the physician is only called upon to discover or exclude the disease, to make a qualitative diagnosis. Here he must, as accurately as the situation permits, discover or exclude clinical tuberculosis and, also, he must make a fair estimate of the amount or extent of the disease, if present, and the damage it has done to the body, make a quantitative diagnosis.

Obviously the examiner's first step is to reach, if possible, a qualitative diagnosis. This is done by the process of exclusion, the method of reasoning and procedure commonly employed by able clinicians in general diagnosis of disease. He must, when tubercle bacilli have not been demonstrated in the sputum, avoid being mentally biased by any previous diagnosis of a former observer; be they physician or layman. He must also reserve his opinion until he has made every practical effort, without undue delay, to find other causes for the symptoms and signs elicited. Almost every symptom and physical sign known to medicine may be present in a case of pulmonary tuberculosis. Yet any of them may be produced by other diseases. It is the relative position, importance and sequence, considered carefully in conjunction with the patient's family and personal history and exposure which, in the absence of tubercle bacilli, enable one to arrive at a reasonably accurate conclusion.

A very important point for the examiner to keep in mind is the great injustice which an incorrect positive diagnosis works to the average young adult. In the writer's opinion, it is far worse to make an incorrect positive diagnosis than an incorrect negative diagnosis. If the person examined is pronounced non-tuberculous he is not branded with the many kinds of handicap that the diagnosis of tuberculosis entails. If he actually has a form of the disease, which will advance, additional symptoms or signs in almost every case lead to another examination, which will correct the error. If we err in pronouncing a positive diagnosis, and the patient undergoes sanatorium treatment, nothing can correct the error. Therefore, in all doubtful cases of adults one should lean to a negative diagnosis. Several examinations of sputum should be made and the morning and evening temperature taken for a week in these doubtful cases

before an opinion is given. Never should a positive diagnosis rest upon X-ray findings, with or without a positive tuberculin test, in the absence of other positive data.

The majority of applicants for admission to a tuberculosis sanatorium present such definite symptoms and signs that a positive diagnosis can be promptly established beyond a reasonable doubt. The presence of tubercle bacilli in the sputum, of course, establishes a positive diagnosis, regardless of history, symptoms or signs.* Therefore, the result of one or more sputum examinations should be known to the examiner before he makes his final examination. When the sputum is positive the examiner has to determine the location and extent of the lesion, the general health and condition of the other organs and the character of the patient. Also, he must discover or exclude other disease or complications and decide whether or not the applicant is suitable for admission to the sanatorium. It must be kept in mind that the mere presence of tubercle bacilli in the sputum does not exclude the possibility of some other disease being the patient's primary or dominating illness.

There are two distinct types of clinical history in the development of most cases of clinical tuberculosis: (1) The gradual or sudden appearance of suggestive symptoms without preceding illness due to other causes. (2) A failure to properly recover from some other illness or injury, with the development of symptoms suggestive of tuberculosis.

Acute infections which involve the bronchi, lungs or pleura are naturally the illnesses most often followed by the development of clinical pulmonary tuberculosis. Pneumonia, pleurisy (which may be tuberculous at its inception), measles and la grippe are prominent examples.

CHAPTER VII.

DIAGNOSIS IN SPUTUM NEGATIVE ADULTS.

No physician is justified in pronouncing a positive diagnosis of any disease which would impair one's happiness or usefulness, unless there is absolute proof of the existence of the disease, or symptoms which are not only strongly suggestive, but have already made inroads upon the patient's health and happiness.

Although pulmonary tuberculosis may exist to a varying extent without producing any symptoms, the following are suggestive of its presence, and in nearly all clinical cases two or more of them are found:

Hemorrhage,	Cough,	Family history or exposure,
Loss of weight,	Fever,	Loss of strength,
Night sweats,	Pain,	Loss of appetite,
Rapid pulse,	Dyspnoea,	Hoarseness,
Digestive disorders,	Sputum,	Menstrual disturbance
		(in women).

NOTE.—* In private practice, when a few tubercle bacilli are accidentally found on a single occasion, in the sputum of a healthy person with no symptoms or signs indicative of tuberculosis, he or she should not be forthwith consigned to a sanatorium.

Hemorrhage (Hemoptysis).—The rare appearance of minute particles of blood in the sputum, when the subject is otherwise healthy and free from suggestive symptoms, even though the point of bleeding cannot be seen in the mouth, throat or nose, does not justify a positive diagnosis of tuberculosis. However, hemoptysis is a symptom which should always be considered indicative of pulmonary tuberculosis, unless some other cause of the hemorrhage can be proven. When a teaspoonful of blood or more is raised, it is strong evidence of tuberculosis, when another source cannot be discovered. It is not infrequently the first symptom which arouses suspicion. Yet it is frequently impossible for the examiner to elicit physical signs which prove the exact site of the hemorrhage. In a striking number of instances the patient has a distinct and correct sensation, indicating the site from which the bleeding comes. One who has had persistent cough for weeks may ignore it until he or she observes blood streaks in the sputum. It is usual, in these cases, for patients to insist that the blood comes from their throat or larynx. They are usually wrong. When a patient raises a considerable volume of free blood, the examiner must be careful to exclude hematemesis from gastric ulcer. There is an extreme waxy pallor after the first bleeding which is characteristic of gastric ulcer. It is very rare to see this marked pallor after the initial hemorrhage of pulmonary tuberculosis. The spitting of free or frothy blood, as a result of advanced cardiac disease, must not be mistaken for hemorrhage due to tuberculosis. The rupture of oesophageal varicosities, or a small vein in the region of the larynx, since the point of bleeding cannot be seen, may cause confusion and remain baffling throughout. Though some authorities point out the rarity of consumption in those with valvular heart disease, it does occur and makes it almost impossible to determine which of the two conditions is the cause of pulmonary bleeding. No doubt, where mitral regurgitation and pulmonary tuberculosis exist in the same patient, pulmonary hemorrhage is usually due to both diseases combined. In these cases the blood vessel walls are exposed by tuberculous ulceration and are easily ruptured by the abnormal back pressure which results from the regurgitation. Neither one of the lesions alone would be sufficient to produce the bleeding.

Loss of weight, to the extent of 5 per cent. or more of the individual's normal weight, in three to six months' time, if investigation cannot elicit another likely cause, is slightly suggestive of tuberculosis. This, however, is only slightly suggestive and of no value in the absence of other evidence. Besides other illnesses, digestive disturbances or injuries, anxiety, unusual work or exposure to extreme heat or bad atmosphere may account for loss of weight. At the same time, either or several of these influences may have caused a loss of weight and permitted or encouraged the activation of a latent tuberculous focus. Intelligent questioning and judicious weighing of the answers elicited, in conjunction with the other symptoms and physical findings, enable us to properly estimate this symptom.

Night sweats, though viewed with dread by the laity and given extreme weight by most of the medical profession, are very frequently caused by other conditions. Here again prolonged or profound anxiety

or nervous strain, from various causes, frequently produce profuse sweating at night. After prolonged or repeated excesses, such as alcoholic or sexual indulgences, are commonly followed by night sweats. Digestive disturbances or general depletion from any cause may give the same result. Any condition associated with fever is usually associated with sweat, as the temperature drops to or below the normal. Septic infection is a striking instance of this. In both instances, tuberculosis and sepsis, the sweat is coincident with the drop in the temperature. In the former this usually occurs at night, between midnight and daylight, while in sepsis it is liable to occur at different times, irregularly. Night sweats rarely occur in tuberculosis except in the very acute or ulcerative stages and where there is more or less mixed infection. So that, in a person whose other symptoms and signs are very vague, evidently not in an acute or ulcerative stage of tuberculosis, sweats are rather against than in favor of a diagnosis of pulmonary tuberculosis.

Rapid Pulse.—This symptom, of absolutely no diagnostic value when detached, is of corroborative importance where there are other suggestive symptoms. Tuberculous toxin produces increase of the pulse rate, but a rapid pulse may be due to any one of a hundred other causes. It is of rather more prognostic than diagnostic value. A patient with tuberculosis whose pulse is habitually 110 or more while at rest has not a good prospect for recovery. In an adult a pulse of 95 or more, when at rest, on several occasions, in the absence of acute cause, should be considered suggestive of tuberculosis. One must keep in mind the ease with which the pulse of many people is markedly accelerated by mere nervousness due to the ordeal of examination. In fact this renders the pulse rate of little value when only one examination is performed. Grave's disease, with slight goitre and little or no exophthalmus, is frequently associated with tachycardia (pulse of 120 to 160 or more). The writer, while examining applicants for admission to the municipal sanatorium at Otisville, encountered several patients who had been recommended as tuberculous, but who presented no symptoms besides rapid pulse, slight tremor, little enlargement of the thyroid gland and a slight cough—undoubtedly uncomplicated cases of Grave's disease. He has also seen undoubted cases of pulmonary tuberculosis complicated by slight, moderate and pronounced Grave's disease.

Digestive disorders are among the commonest first symptoms of invasion of the lungs by the tubercle bacillus. Inability to eat a fair amount of regular food for breakfast, with gastric discomfort or even epigastric pain after taking food, are the symptoms most frequently encountered. Hyperacidity, which manifests itself most frequently when stomach digestion should be almost complete, as heart-burn, sour acid or bitter eructations, with or without epigastric discomfort, may be the first indication that the patient has tuberculosis. This is generally associated with loss of weight and constipation. A general lack of endurance also develops early in these cases, with some dyspnoea on unusual exertion. Although the latter symptom, dyspnoea, and even the lowered endurance, may not have been noted by the patient, being elicited only as a result of the physician's questions. Many of these patients, who complain only of indi-

gestion, have a slight cough with scanty sputum, "from the throat" or "stomach cough," as they say, in the early mornings. Marked digestive disorders of almost every description develop in the advanced and later stages of the disease. They are frequently the most distressing symptoms the patient has and are often the most difficult to relieve.

Cough is unquestionably the commonest symptom of pulmonary tuberculosis. In at least 90 per cent. of all clinical cases it is, or has been at some time, a prominent manifestation. So true and universally understood is this that any cough creates lay suspicion as soon as it is heard. There is a tendency on the part of some to attribute only certain kinds of cough to consumptive origin. The so-called "hollow," "racking" and "loose" coughs all have peculiar and sinister meaning for some, especially the phthesiphobic members of society. The fact is that there is no type of cough which is characteristic of consumption. In the early and sometimes in the later stages of the disease the only cough present is an almost noiseless clearing of the throat. The writer has seen a long uvular produce a most distressing cough, which had endured for five months before the young man was sent to him with a diagnosis of pulmonary tuberculosis. Surgical removal of half an inch of uvular relieved this cough at once. As no other signs or symptoms were detected, the diagnosis of tuberculosis was disproved. Obviously any disease or injury which causes congestion or obstruction of the pharynx, larynx, trachea or bronchi, produces cough. Diseased adenoids in the naso-pharynx, with discharges into the pharynx, or posterior nasal discharges, are not uncommon causes of cough. A cough which lasts for six weeks or longer, when careful investigation fails to detect any cause above the trachea, should be considered suggestive of tuberculosis. It must also be kept in mind that disease of the upper air passages frequently co-exist with pulmonary tuberculosis. So that a pharyngeal cause for cough does not exclude the presence of lung involvement where other indications of the disease are detected. When the diagnosis is difficult and a possible cause of the cough is found in the nose, naso-pharynx, pharynx or larynx, the abnormal condition in the upper air passages should be corrected and the patient then examined. There are also many forms of bronchial or pulmonary disease, besides tuberculosis, which produce cough. Therefore the mere presence of cough, even though another cause cannot be detected, is not enough upon which to pronounce the case one of tuberculosis. Occasionally one encounters a cough of purely neurotic origin. Neurotic cough, however, rarely lasts six weeks. It usually disappears, with or without treatment, within a month. Attention to temperature and other simple lines of investigation will prevent error in these cases.

Fever.—It has been said that, in the temperate zone, any continued fever which persists for more than three weeks is due to one of three diseases: tuberculosis, septicaemia or typhoid fever. So that if two of those named can be excluded it is practically certain to be the third. In clinical experience it is striking how frequently the above statement is proven true. It is fairly safe to go further and say that a fever, to 99.6 or more, every afternoon or evening with a temperature of 97.8 or less every morning for ten days, if sepsis can be excluded, is due to tuberculosis. There is,

however, no infallible rule in clinical diagnosis. A constantly subnormal temperature in the early morning is about as significant of tuberculosis as is the evening fever. In fact, one sees quite a number of cases of tuberculosis in which the only variation of temperature from the normal is the early morning subnormality. This may be the case in slight involvements with extreme general depletion from other cause. It also occurs in some cases where the disease is widespread or advanced with extreme general depletion, when the lesion is walled off by fibroid tissue and calcareous deposit, or when the combative elements in the body are too deficient to react to the toxic substances of the disease. In these cases of pronounced tuberculous lesion, with no evening elevation of temperature, there is usually no reaction (negative) to the usual tuberculin and complement fixation tests.

One must keep in mind that fever is an accompaniment of every infection or inflammation and that subnormal temperature occurs in any condition producing temporary or permanent lowering of the general vitality. Over-exercise, emotion or extreme excitement may cause temporary elevation of the body temperature in a perfectly normal person. Shock or variation and consistent relation of elevation and subnormal temperature, It is, therefore, seen by the foregoing that fever, cough and night-sweats are not enough to justify a diagnosis of tuberculosis. The three are commonly associated in grippe and in catarrhal infections of the respiratory apparatus. The character, duration and regularity of the fever must be determined before its significance can be judged. In doubtful cases the temperature must be properly taken morning and evening (7 to 8 a. m. and 5 to 6 p. m.) after resting, every day for ten days and recorded in writing. Mouth temperature will do, if the thermometer is held under the tongue, with lips firmly closed, for three minutes. If on seven days in the ten (not only the first seven) there is an evening elevation above 99.2 and a morning temperature of 97.8 or less it is strongly indicative of tuberculosis, if other suggestive symptoms are present. It is this daily variation and consistent relation of elevation and subnormal temperature, for a considerable period of time, that gives the temperature special significance in the diagnosis of tuberculosis. It must, however, be kept in mind that some cases of tuberculosis give rise to most erratic febrile manifestations. So that even here there is no infallible rule.

Pain.—Since sensory nerves are not distributed to the substance of the lungs, and only with modified function to the bronchi, pain in the chest does not occur in pulmonary tuberculosis until the pleura is invaded by the lesion or by the inflammatory zone surrounding the lesion. It is true that some lesions begin their clinical history by involvement of the pleura, in which case pain would be an early symptom. Pleurisy, with or without the prompt production of fluid effusion, may be the first manifestation of pulmonary tuberculosis. Here the pain may be in the region of the nipple, along the outer border of the scapular or over the apex of the lung. In those cases where the lesion is centrally located, near the bronchi, pain is not felt in the chest until later (if ever), when the disease spreads to the pleura. Some patients never experience this symptom at all, even though there be extensive lung involvement. There may

even be large cavities without any pain. Pain in the form of neuralgia, due to circulating toxins, either specific from the tubercle bacillus, or from gastro-intestinal ferments, is present in some cases. These neuralgias may involve any of the sensory nerves. Intercostal neuralgia of this origin is often mistaken for the pain of pleurisy. It may be produced or increased by deep breathing, coughing or laughing, although this is more characteristic of pleuritic pains. Intercostal neuralgia can, however, usually be differentiated by the fact that moderate pressure over the points where the cutaneous branches of the intercostal nerves penetrate the deep fascia causes acute pain. Moderate pressure over these points (lateral and posterior) does not produce pain in pleurisy, when it is unassociated with nerve involvement. Frequently steady compression of the affected side of the chest, between the two open hands, will relieve the pain of pleurisy. This rarely relieves and may accentuate the pain of intercostal neuralgia. Finally, herpes zoster, which is often a part of the clinical picture in intercostal neuralgia, may come and clear up the diagnosis. Though intercostal neuralgia may be caused by tuberculosis, it is more often of rheumatic, gouty or digestive origin. The commonest cause of pleurisy and, therefore, the pain of pleurisy, is tuberculosis, but there are many other causes, infections and injuries, so that other suggestive symptoms and signs should be present before a diagnosis is pronounced.

The pain in the chest due to tuberculosis may be continuous, but it is usually exaggerated or sharpened by deep breaths, laughing, crying, sneezing or coughing. In a large group of cases it is only present during these acts. In a considerable percentage of those in whom the diagnosis is relatively difficult there is more of a feeling of dull ache, the ache of over-tired muscles, in one shoulder or along the margin of the scapular. The pain and feeling of rawness felt in the median line under the sternum and the soreness of epigastric muscles which is produced or accentuated by cough is of no special significance. Pain in the throat, felt in the region of the larynx on swallowing, especially when swallowing fluids, should be given careful consideration. A laryngoscopic examination should be made in these cases to determine the presence or absence of tuberculous laryngitis.

Pain in the early stages of lobar pneumonia is rarely mistaken for a symptom of pulmonary tuberculosis, on account of the acuteness and severity of the associated symptoms. Yet we must always keep in mind the possibility of acute exacerbation of an old tuberculous lesion, and study the symptoms, signs and sputum with this in view. The pains of angina pectoris or aneurism are, in rare instances, sufficiently atypical in character and location to make an erroneous diagnosis of tuberculosis possible. Here the history and careful examination of heart and blood vessels, which should be performed in every case, as well as of the lungs, sputum and temperature, will bring out the truth. Intrathoracic growths, such as sarcoma and carcinoma, produce very severe and persistent pain. Acute pain in the chest, especially when situated in the lower half, is not infrequently caused by peritonitis, gall stone impaction, gastro-duodenitis, ulcer of the stomach or duodenum, abscess of the liver, subdiaphragmatic

abscess, intestinal obstruction or perforation, renal colic or even appendicitis. All of which have been mistaken for pleurisy. It is quite common in disturbances of the liver or gall tract to have the pain reflected to the right shoulder. These facts emphasize the necessity of approaching the diagnosis of even tuberculosis by comprehensive exclusion.

Dyspnoea.—Shortness of breath and loss of strength or endurance are so closely allied in many cases of early tuberculosis that some patients find it difficult to distinguish them. In those persons whose normal activities never include strenuous or more or less sudden exertion, recognizable dyspnoea is not manifest until after more prominent symptoms have come to the front. These people, when hurrying up stairs or running a short distance, may feel shortness of breath and think it due solely to the unusual exertion. They are inclined to think that such is common to all people of their general physis. On the other hand, those who have been accustomed to move about quickly are likely to attach more significance to shortness of breath and mention it.

Although dyspnoea is usually in direct proportion to the extent of lung compromised by disease, there are many striking exceptions to this rule, as far as we can judge by physical signs. Some very early cases with limited or no physical signs complain of or experience pronounced dyspnoea on even moderate exertion. In some, dyspnoea is felt when the patient is at complete rest. This type of dyspnoea, manifest even when the patient is lying down and with slight or no physical signs indicative of lung changes, is quite characteristic of acute general miliary tuberculosis. Rapid respirations, with or without cyanosis of the lips and extremities, may indicate the presence of dyspnoea, which is not felt by the patient. Dyspnoea in the form of acute air hunger, such as is seen in an attack of asthma, is usually due to either spasmodic contraction of the medium-sized bronchial tubes or swollen bronchial mucous membranes. This is met with in general bronchitis, which may or may not be of tuberculous origin, or it may be due to cardiac insufficiency. Cardiac asthma or dyspnoea is nearly always distinguishable by the history of its onset, the size and position of the heart and the heart sounds and, in some cases, oedema of the lower extremities. In cardiac asthma the chest rales are equally distributed on both sides of the chest and are chiefly of the moist variety.

Sudden dyspnoea due to rupture of the lung and the resultant pneumothorax is usually associated with sharp pain on the affected side. Here the physical signs of pneumothorax prevent an error in diagnosis. This accident is usually seen in advanced lung disease.

Dyspnoea due to foreign bodies in the air tract, the membrane in laryngeal diphtheria or laryngeal spasm is most often seen in children, where the history and signs are so clear that a mistaken diagnosis is not at all likely.

Finally we must never lose sight of the fact that any condition of pronounced general depletion or anaemia, from whatever cause, is associated with dyspnoea on strong or prolonged exertion.

Sputum may be raised in any inflammation or irritation of the nose, naso-pharynx, pharynx, larynx, trachea, bronchi or lungs. Its mere pres-

ence is not diagnostic of any special disease. Neither is its gross character or amount diagnostic. A curious belief has been held by some, that if the sputum sinks in water it is due to consumption, if it floats it is not. This, of course, is a mere superstition. If sputum is filled with air bubbles it will float, no matter what the infection. If it is relatively solid it will sink, no matter what the infection. As has been said, blood in the sputum, if no bleeding lesion can be seen in the mouth, nose or throat, is strongly suggestive of tuberculosis. Sputum may be raised with or without cough and if it persists, with or without other suggestive symptoms, for a month or more it should be examined for tubercle bacilli. If the bacilli are demonstrated, the case is one of tuberculosis. If tubercle bacilli are not found, tuberculosis is not excluded thereby. In some cases of tuberculosis the only sputum raised is scant and raised only in the early morning without cough. Those patients who raise one or two teacupfuls or more of sputum every day for a long time are almost sure to have either a large ulcerative or bronchiectatic cavity or cavities. The cavity remaining after spontaneous rupture of a pulmonary abscess produces a large amount of extremely foetid sputum. The sputum from some cases of bronchiectasis is also foetid, but rarely quite so offensive as the discharges from lung abscess.

The blood-stained sputum ("prune juice" expectoration) in lobar pneumonia has been mistaken for the hemoptysis of pulmonary tuberculosis. The sputum here is usually almost uniformly brownish, thick and stringy at first, later semi-fluid. It is bright red in some cases, but even here the symptoms and signs are sufficiently characteristic to exclude error.

Family history or exposure to other cases of known or suspected tuberculosis, though not essential to a positive diagnosis, should be carefully sought for in every case where the question of tuberculosis arises. A history of tuberculosis in the family of the person under examination is more likely to be given too much than too little weight in pronouncing a diagnosis. If a brother, sister or parent first developed evidences of tuberculosis after the patient reached adult life and was subsequently not in close or prolonged contact with the patient, it should be given little or no weight. It is undoubtedly true that, although we do not believe tuberculosis to be actually hereditary, the children of tuberculous parents inherit tissues peculiarly fertile for the growth of tubercle bacilli, or are exposed in early life to such concentrated dosage of fresh bacilli that they are unable to resist infection. It is also true that infancy is the most susceptible period of life for this infection. So that when the parent, especially the mother who is constantly in close contact with the infant, has an open lesion at the time of the child's birth, his or her chances to escape infection are very small. If a brother or sister is suffering with tuberculosis in the home during the child's infancy, the probability of the infant's infection is also very great. At any age up to and including puberty such close and continued exposure is extremely dangerous. The probability of infection diminishes with advance in the age of the person exposed. Whether such intimate exposure to cases of tuberculosis in a different family would be more or less dangerous at

these ages is not known. By the inheritance of some relative immunity to the particular strain of bacilli in one's own family, it would seem that exposure to a foreign strain would be more likely to infect or, at least, would prove more disastrous after infection. It is believed, and is probably so, that the vast majority of these early infections do not give rise to clinical symptoms of the disease, if at all, until the infected person arrives at or near adult life. Undoubtedly most of the cases of tuberculosis, first discovered after the age of thirty or thirty-five, are simply manifestations of activity in a healed lesion of very early life.

Although susceptibility diminishes with advancing years, as far as we know it is never lost. Therefore we must inquire regarding probable close or prolonged exposure to known or suspected cases of tuberculosis, at any time, in all cases that come before us for diagnosis. It is not uncommon to learn that your patient's roommate at boarding school had symptoms suggestive of tuberculosis. His or her playmate in childhood may have been the source of infection. Especially is this likely when they visited one another and shared the same room or bed. When a child, their nurse may have been tuberculous. Later in life a college roommate, or at work an office-mate or even desk-mate, may have had the disease. Unless the exposure is indoors, except in the case of very young children who frequently hug and kiss each other out of doors, it is of little or no danger. One's wife, husband or consort is a not infrequent source of infection. The sanitary condition of life or the home in which the exposure was experienced is of great importance. The less sanitary, the less air and sunlight, the less wholesome the food and the less cleanliness the greater the hazard. Family history or the history of exposure to tuberculosis should have some weight, but neither should ever be the deciding factor in a diagnosis. It is almost a certainty that every person living at the age of twenty-one years has at some time been more or less intimately associated with one who was infected with tuberculosis. The entire importance of exposure rests upon two factors: the conditions of exposure and the condition of the person exposed. We must know these before estimating its proper weight in diagnosis. If an adult applicant is living under uncontrolled exposure to tuberculosis, and the diagnosis, though not certain, is probably positive, it is wise to pronounce it positive and admit them, unless they can be otherwise freed from exposure and properly treated.

Loss of Strength.—Unusual fatigue and lack of staying power, unusual for the individual patient, as measured by their previous experiences, is common in all chronic diseases. It is of no special significance in arriving at a diagnosis of tuberculosis. Only after close questioning and investigation should it be given even a minor place in the clinical summary.

Loss of appetite occupies the same relative position as loss of strength. It is only of importance when no other cause can be elicited, and in the presence of other symptoms and signs of more specific significance. It is rather peculiar to some cases of tuberculosis that appetite for breakfast, the early morning meal, is either lacking or a distinct aversion to food is experienced at this time. This aversion to food in the early morning is the most prominent symptom in some early or doubtful cases of tubercu-

losis. It may be the only symptom that prompts the patient to seek medical advice. This complaint, extreme loss of appetite for breakfast, would, therefore, seem to be of more significance in this connection than loss of appetite for any other meal in the day. Some even feel nauseated at the normal breakfast time. The latter being a prominent symptom of chronic gastritis from several causes, especially the excessive use of alcoholic drinks, all other causes must be excluded, as far as possible, before morning nausea is given weight in the diagnosis.

Hoarseness, where other symptoms are suggestive of tuberculosis and no other cause can be assigned, is not uncommonly due to tuberculous laryngitis. If it is associated, in such a case, with pain on swallowing, its significance is increased. All patients with a persistence of this symptom should undergo a laryngoscopic examination by an experienced, though not too highly specialized, observer. An almost complete loss of voice, with pain and difficulty on swallowing, signifies in most instances induration and ulceration of the larynx, epiglottis or vocal cords. Such extreme cases are usually not suitable for sanatorium treatment. Especially is this the case when, as is very common, the lung disease is extensive and advanced.

Menstrual Disturbances.—Prolonged intervals between menstrual flows, scanty or suppressed flow is a rather frequent accompaniment of tuberculosis in women and girls. This also occurs from many other causes, so should not be given too much weight from the standpoint of diagnosis. In those who have tuberculosis temporary suppression of the menses indicates considerable depletion by the disease, but does not justify a grave prognosis. One must be on their guard to avoid attributing this occurrence to pregnancy or serious uterine disease. At the same time tuberculosis does not exclude the development of pregnancy or uterine disease. In some cases excessive menstrual flow, irregular or frequent flow may be present, though this is much more rare than interrupted or scanty flow.

PHYSICAL SIGNS.

Probably the most difficult role to fill in the examination of one suspected of having tuberculosis is that of an honest interpreter of the physical findings. It is not too much to say that not less than twenty-five per cent. of the definite location of lesions, even by eminent specialists, in sputum negative cases, are sheer guesswork based upon history and symptoms. This applies equally to the interpretation of X-ray plates by the most experienced observers. The only difference being that, when the X-ray specialist has not the benefit of history and physical signs, the incidence of guess is much higher than twenty-five per cent. The almost irresistible tendency to pronounce exact findings, not actually perceived by the special senses, is due to the knowledge that growth of clientel is enhanced most by positive statements. This is not peculiar to the medical profession, it is a general weakness of specialists in any work, and is the inevitable answer to the universal demand for definite knowledge. When a man has once built a reputation for the possession of exact knowledge he is the slave of his reputation and has not the courage to

admit, even to himself, an inability to be exact and honest at the same time. So that, although his clientel may have become as great or greater than he can properly serve, his positive guessing continues when positive evidence is lacking. No doubt experience and talent in the estimation of history, symptoms and those signs which are present guides the specialist to a correct guess in many instances. It does not follow that a diagnosis of pulmonary tuberculosis is disproven by an incorrect location of the lesion. There are a number of cases in which a positive diagnosis can be firmly established and yet the focalizing physical signs are so vague or scanty that the lesion can not be located. In some, by careful exclusion, we can prove the existence of tuberculosis when no signs of pulmonary lesion are elicited. In these cases the X-ray plate nearly always admits of any interpretation.*

Methods.—The physical examination of one for the detection or exclusion of pulmonary tuberculosis should be complete and include the careful application of the usual methods in their proper sequence: *Inspection, Palpation, Percussion, Auscultation*. Special methods, such as X-ray, tuberculin tests and complement fixation, may be employed when thought advisable. But a urine analysis should be done and the blood pressure taken in every case for the detection of complications.

Inspection, exercised by a talented physician who has given close attention to this method of exploration, very frequently prevents serious error in the interpretation of other findings. Its importance, too often forgotten, can not be overemphasized. The extreme and almost characteristic pallor resulting from hemorrhage in gastric ulcer has, on two definite occasions, prevented the writer from pronouncing the cases tuberculosis, where the history was highly suggestive and a gripp infection had provided the temperature and râles that completed the consumptive picture, and had lead to previous error in diagnosis. Slight exophthalmus or goitre, as well as the tremor of Grave's disease, if not observed, may leave symptoms and signs almost diagnostic of a tuberculosis which does not exist. Many other groups of visible signs might be mentioned which are of value in preventing an erroneous positive diagnosis. On the other hand, there are many visible indications of tuberculosis which are of great assistance in those cases of the disease where other evidence is slight or lacking.

The voice and the ease or difficulty with which the patient breathes should be noted in the beginning of the examination. The bearing and carriage, as well as the voice, are a good indication of the patient's strength and vigor. The size of the pupils should also be noted. A thin and nervous patient with furtive eyes and very small pupils should make the examiner think of a possible opium habituae. One who is emaciated from tuberculosis will have either normal or slightly larger pupils than normal and the eyes are often more fixed and steady than in health. When a thin, pale face with marked zygomatic prominence and a patch of color confined to the cheeks, with deep-set steady eyes and a small

* NOTE.—The signs given by some writers as being indicative of what they call "Pretuberculosis" have no place in this work.

neck, speaks with a high-pitched voice of little volume, further investigation rarely changes the first impression.

No matter how convincing the signs revealed by inspection, the other methods should be completely applied before the examiner permits himself to form an opinion. There is no picture which is infallible and, even though the patient may be tuberculous, he may have important complications which must be detected.

Before considering physical examination of the lungs, a word must be said concerning the necessity of having full and unhampered access to the entire chest. When the subject is a man and the room is not cold there is never any objection to the removal of all clothing to the waist. If the examiner is to avoid overlooking some important changes in the lower part of the chest, he must insist upon the same freedom when examining female subjects. A loose cloth or cover may be employed to fill the demands of modesty, as far as possible, throughout the examination.

Much has been said and written in efforts to describe the typical phthisical chest. The reason this effort is so voluminous is that there is no typical chest in this disease. Tuberculosis may be present to any stage in any shape or form of chest. The flat, narrow, schaphoid, ala, round and many other terms have been employed. It is true that where there is advanced disease in the upper lobes the supra and infra clavicular regions are depressed and do not expand with inspiration. Also the scapulae stand out like wings (alae) and the chest is flat or narrow when emaciation is extreme. However, it is not uncommon to find signs of the disease in normal, even robust or fat, people with perfect chest contour. Clubbing of the fingers and toes is a striking sign of long-existing disturbance of the lung or general circulation. It is usually most marked where the cause was present when the patient was quite young. A sign elicited by inspection which is given little prominence, but which is almost infallible, is visible cardiac action in the third left intercostal space. This sign, in one who has not advanced valvular cardiac disease, nearly always signifies tuberculous involvement of the left upper lobe.

The chest must be viewed carefully as a whole in search of any deformity. It is only by comparing the two sides that we can detect a symmetry. When not caused by rickets in infancy or childhood or by spinal curvature, marked symmetry is usually due to destruction of lung by tuberculosis. Greatly enlarged heart, empyema or injury should not be forgotten as occasional causes of this deformity. Limited expansion if bilateral, or general over the chest, is more likely to be due to individual habit than disease. When unilateral, or confined to one region, or if expansion is entirely absent over a limited area, as is sometimes seen, it is strongly suggestive of disease of the lung. In paraplegia due to injury or tumor of the spinal cord, at the level of the fifth cervical vertebra, there is no chest expansion; breathing is entirely diaphragmatic or abdominal, due to paralysis of the chest muscles.

Palpation.—One should first palpate for enlarged lymph nodes in

the cervical region. Very small, shot like, superficial and widely separated nodes are of slight or no significance. Also palpable glands near the margin of the inferior maxilla in children, who have or have recently had unhealthy condition of the tonsils or throat, are of slight or no significance. Glands the size of a bean or larger, especially when deeply seated, which have persisted for a month or longer, in adults who have not recently had disease of the throat or tonsils, are due to tuberculosis, lymphadenoma, Hodgkin's disease or syphilis. Tuberculous cervical glands are usually either unilateral or unevenly distributed and of widely varying sizes on the two sides. In Hodgkin's disease the cervical glands are enlarged about equally on the two sides and are usually located in the supra-clavicular triangle. Syphilitic glands are bilateral, not so large and with a tendency to remain small. Tuberculosis glands may or may not be tender on vigorous palpation and they may or may not suppurate and fluctuate. When fluctuation does develop in a cervical lymph gland, which is obviously not due to acute septic infection, it is practically always tuberculous. In Hodgkin's disease and syphilis enlarged glands are rarely tender and rarely or never fluctuate on palpation. Tuberculous glands may be felt in the axillae or groins. They are rarely if ever symmetrical on the two sides, but are usually so in Hodgkin's disease and syphilis.

Limited expansion of one region or side of the chest may be detected by palpation. When sufficiently marked to be thus appreciated it indicates disease or deformity of the chest, lung or pleura on the diminished side. It is usually much easier to detect diminished expansion by inspection than by palpation. Furthermore, when lung disease has progressed enough to produce discoverable alteration of expansion, the physical signs on percussion and auscultation are unmistakable. Expansion may be reduced by consolidation due to infiltration of lung, atelectasis or collapse of lung, thick pleura, hydro-thorax, hydropneumothorax, pneumo-thorax or acute dry pleurisy, of tuberculous or other origin. It may be caused by intra-thoracic growths or hemiplegia. It is also seen in intercostal neuralgia, where pain prevents free motion of the affected side. The most common cause, no doubt, is tuberculous involvement of the lung or pleura. Vocal fremitus is also palpable and its variation from the normal for a given region indicates disease changes in the lung or pleura. Consolidation of lung, by tuberculous or other infiltration, if the bronchus is not obstructed or pleura not markedly diseased, produces increase of vocal fremitus over the area consolidated. If considerable emphysematous lung overlies a consolidated area, vocal fremitus will be diminished thereby and may be felt on the surface as normal or diminished in force. Thick or adherent pleura or a moderate accumulation of fluid in the pleural cavity causes diminished vocal fremitus over the diseased area. Emphysema diminishes vocal fremitus. Normally, vocal fremitus is greater over the right upper lobe than over the left. This difference is specially marked over the apices. Therefore, if the fremitus felt over the left apex is as great or greater than that felt over the right apex, there is either infiltration (consolidation)

in the left apex or diseased pleura over the right. Vocal fremitus is normally much less forceful over the lower lobes than over the upper lobes on both sides. Where there is extreme accumulation of fluid or semisolid exudate in the pleura, an occluded bronchus, large intrathoracic growth or pneumo-thorax vocal fremitus is usually entirely absent over the area affected.

Percussion sounds, like all other physical signs, vary with the different regions of the chest in the normal. While employing this method, as in all other methods, the examiner must keep constantly in mind the position and functional movements of the underlying organs. A thorough familiarity with the various percussion notes elicited over different regions and in persons of different ages and build, in the normal, is a primary essential. No examiner can ever even approximately interpret the meaning of the notes elicited in disease if he has not an extensive experience with the variations elicited in different kinds of normal people. Given a stroke of uniform force, percussion produces a note high pitched and dull, according to the density of the underlying structure. Air contained within the underlying organs adds resonance according to its relative quantity. The quality of the note depends upon the shape and relations of the solids or fluids and air within. Air in small spaces, as in the lung, gives resonance of a quality called pulmonary resonance, but which varies in different normal people. By comparing the two sides one can usually detect changes from the normal. Over large air spaces tympanitic or musical percussion sounds are elicited. It is very rare to be able to produce this quality over ulcerative cavities in the lung. Even in pneumo-thorax, though a tympanitic or hollow percussion sound is often elicited, it may be masqued or absent because of solid exudate, thickened or adherent pleura. Distinct dullness over a region normally occupied by lung tissue signifies consolidation, thick pleura, fluid in the pleural cavity or growth. Hyperresonance is caused by emphysema. Percussion over thin walled large cavities, while the patient's mouth is open, produces a cracked-pot sound. This is usually detected only over very thin chest walls. A coin lying flat against the chest wall over pneumo-thorax and tapped with another coin produces a metallic sound heard abnormally distinct by the ear or stethoscope on the opposite wall of the same side. The sense of resistance felt by the percussing finger over fluid in the pleura is about as diagnostic to an experienced observer as any other physical sign. The degree of dullness, or impairment of resonance over a diseased area depends upon the degree and extent of consolidation, and also upon the depth and distention of un-infiltrated air cells over it. Since in the early months of tuberculosis the tubercles are usually scattered, with healthy lung tissue between, percussion is likely to give little or no reliable aid in the detection of early disease. There has probably been more nonsense, more unreliable statement and writing expended concerning percussion as an aid in the diagnosis of incipient tuberculosis than in any other proceeding in the practice of medicine. In the vast majority of cases of pulmonary tuberculosis, where the tubercles and concomitant inflammation develop in the

interior of the lung, percussion does not elicit any appreciable change in the quality, pitch, duration or intensity from the normal sound until the disease is fairly well advanced. Percussion is, therefore, of little or no aid in the diagnosis of most early and uncomplicated cases of pulmonary tuberculosis.

Auscultation is unquestionably the most valuable method, in physical examination, for the diagnosis of pulmonary tuberculosis. When the subject is suspected of having tuberculosis it is well to invariably begin auscultation by examining the heart. Otherwise it is possible that, the lungs being the primary object of investigation, auscultation of the heart may be entirely overlooked.

Here, as in percussion, it is essential that the examiner be familiar with the respiratory, voice and cough sounds normal for the various regions of all kinds of normal chests. It is also necessary to understand clearly the physical principles involved in the origin of these sounds. They are dependent upon very simple physical conditions, which are analogous to conditions producing sounds outside of the body, with which we are all familiar. As every one knows, air currents of considerable velocity produce sound when they are confined or meet obstruction. A brisk wind passing through rushes or foliage produces a murmur which is the combined result of all the sounds produced by obstructions and divisions at every leaf. Passing rapidly through a tube air produces a different sound, a tubular sound. Passing over an opening in a cavity, as blowing over the mouth of a bottle, still another sound is produced, an amphoric (musical) sound. Sound is loud or faint, according to the nearness or distance of the listening ear from its point or origin; and, also, according to the thinness or thickness, singleness or multiplicity of the interposed solid structures through which it must pass to reach the ear. The above principles are all learned by everyone in very early life. Given a familiarity with normal chest sounds, it is only necessary for the examiner to apply these principles intelligently, in conjunction with a good knowledge of anatomy, physiology and pathological anatomy. Medical students are taught to divide all sounds heard in diagnostic auscultation into the elements of Quality, Duration, Pitch and Intensity. Much has been said and written concerning the significance of changes in these elements, but it is the *quality* of a sound that tells us the nature and position of its origin, in the vast majority of cases. Intensity is largely dependent upon the force of the respiratory, vocal or coughing act. Duration is of little variation in many different sounds, and also depends somewhat upon the duration of the causative act. Variations of pitch, unless extreme, require an ear highly educated in music or of rare talent for their detection. But quality is the element of sound which enables one to recognize the voice of an acquaintance, a faculty common to us all. It is through quality that we know the sound of a bell, a drum or the wind in the trees. Physicians may specify the intensity, pitch and duration of respiratory murmur, bronchial or bronchovesicular breathing, but it is by their quality that they recognize them.

A fifth element, or perhaps more properly, a subelement of quality,

the *distinctness* with which words spoken or whispered are heard on the surface of the chest, is of importance in auscultation. When heard more clearly and louder than normal it is called increased vocal resonance, and is due to infiltration of the lung tissue, with resultant reduction of the number of partitions and air spaces through which the sound must pass from the bronchus to the surface of the chest. The degree of increase is in proportion to the completeness and extent of infiltration. When there is solid lung tissue about a cavity the spoken or whispered voice is heard as a distinct echo from within. This is called egophony. This sign is also heard in some cases of absolute consolidation of a considerable area of lung, even without a cavity. When it is musical and of a bleeting character there is either a cavity within a consolidated area or an opening into the pleural cavity with direct communication between a bronchus and the air filled pleural cavity. Other signs indicate which of the two conditions exist in a given case. When the voice of whisper (which latter is often more satisfactory than the loud voice) is markedly increased, but not distinct and bleeting enough to be called egophony, it is called bronchial voice, whisper or cough. This is the vocal sound usually heard over consolidated lung. Obviously all of these voice sound changes are indicative of fairly well advanced pulmonary disease, where many other symptoms and signs are present to make the diagnosis easy.

In most cases of early pulmonary tuberculosis, with negative sputum, there are heard only four, or one of four, physical signs indicative of its presence. Pleuritic friction sounds, broncho-vesicular breathing, diminished or distant breathing and voice sounds and râles. These cases which begin with pleurisy may present, when first seen by the physician, only pleuritic friction sounds or signs of fluid in the pleural cavity on one side. The quality (only learned by experience) and distribution of pleuritic friction sounds enable the examiner to recognize them. They are rarely bilaterally located in tuberculosis. Bronco-vesicular breathing has been called "harsh," "rough," "granular," "blowing" and probably by many other names. It is a mixture of tubular (bronchial) and vesicular qualities, heard normally over the primary bronchi and right apex. The bronchial element, unmixed, is heard normally over the trachea and the vesicular element is heard over the lower lobes of both lungs and the entire left upper lobe.

When the lung tissue is infiltrated the vesicular element, or quality, is naturally lost in proportion to the degree and continuity of infiltration, leaving the harsher bronchial quality dominant. Also the contractility of the still patulous, or open, air cells being compromised, the passive expiratory sound is prolonged. So that the expiratory sound, normally less prominent than the inspiratory, is equal or more prominent, high pitched and prolonged. But, it is the quality of the sound which makes it recognizable. The inspiratory sound may also be of a peculiarly harsh quality over consolidated or partially consolidated areas. The respirations should be deep, uniform and rapid enough during the examination to make quick comparisons. Diminished or distant breath and voice sounds may be the only audible sign elicited in some cases of tuberculosis. This

may be due to either or both of two causes. The pleura may be thickened from disease. The peribronchial infiltration may be only enough and just so distributed to restrict and diminish the ingress and egress of air to and from the air cells in the involved area.

Râles may be dry, sibilant or sonorous, when the bronchial mucous membrane is swollen in a diseased area, or the bronchi contain viscid mucus, but it is small or medium moist râles that are most characteristic of tuberculous lesions. They may be heard with ordinary deep respirations during either the inspiratory or expiratory acts. But one should never say that no râles are present until they have listened during and immediately after several acts of coughing. Moisture which may be quiescent and still during respiration is often thrown out into the path of active air currents by cough, and the first inspiratory act after cough will produce moist râles where none could be heard without the cough. In this procedure, however, it is very important to avoid misinterpretation of some oesophageal râles (or sounds) heard near the median line, and even over the apices, in some people after cough. This is not an uncommon error. There are also undoubtedly râle-like sounds of muscle origin, miscalled râles in some cases. The actual presence of moist râles, heard unilaterally, is the most convincing single physical sign indicative of pulmonary tuberculosis. Even this, however, is not enough, if there is no other evidence.

The X-Ray or Roentgen Ray, although given great weight by some enthusiastic observers, as an aid in the diagnosis of otherwise difficult cases, has so far proven to be a disappointment. In an article describing the crucial examination of a regiment of army recruits in 1917, for which \$1,500 was appropriated to cover the expense of X-ray plates, Dr. Lawrason Brown has the following to say: "In the plates of 1,030 men of this regiment 1,000 were useful for study. Of these thirty-four were found to have such definite parenchymatous shadows that Major Cole and Lieutenant Allison would advise rejection. The plates of thirty-two others strongly suggested tuberculous lesions. Baldwin, Heise, Sampson and I went over those plates very carefully and on account of the changes which we interpreted as old lesions, would reduce Cole's figure of thirty-four to twenty-eight, and add the six to the doubtful cases, making thirty-eight. The six cases and some of the other doubtful plates, had they been found in patients with symptoms, could have been interpreted, no doubt, as showing definite tuberculous changes. Dr. H. M. Biggs and Major Connor agreed in the main with these interpretations.

"The physical examination of these men was undertaken by a group of good clinicians, under Major Connor of Cornell. The results of their examination was most interesting. Of the entire regiment (about 2,200 men), they certified six for rejection on account of tuberculosis. Of these six, four showed lesions in the Roentgen ray plate and were rejected, while the other two had negative plates and were accepted. Of the four rejected only one fell in the group of the thousand already examined by Roentgen ray, and his plate revealed

advanced disease." In other words, in thirty-four positive diagnoses by the X-ray, more extended investigation proved, as far as proof is obtainable, that thirty-three were wrong. Diagnosis by palmistry could hardly give a higher percentage of error than this, and would certainly be less expensive.

Tuberculin, as an aid in the diagnosis of clinical tuberculosis is just as valueless as the X-ray or Roentgen ray. In an article reporting a series of investigations of the various methods of employing tuberculin for diagnosis, carried out under the writer's directions in Bellevue Hospital and the Municipal Sanatorium at Otisville in 1913, is the following, which is just as true now as it was then: "The Von Pirquet test is undoubtedly harmless and is the only one in which I can see no objection to its use as a diagnostic routine, although it is of very little practical value after the age of five years."

Competent Fixation has not yet been developed or been tried in a large enough number of cases to be considered a reliable diagnostic measure. Dr. Van Wadel is at this time engaged in work along this line, which the writer has been privileged to observe to some extent, and which seems to promise results of some value.

In an effort to arrive at a reasonable standard of diagnosis for use in the Community Health and Tuberculosis Demonstration now being carried out at Framingham, Massachusetts, the following committee was appointed on Diagnostic Standards: Dr. Arthur K. Stone, Chairman; Dr. Edwin A. Locke, Dr. Cleveland Floyd, Dr. John D. Haws, 2d, Dr. Elliot Washburn, Dr. Vincent Y. Bowditch, Dr. Edwin R. Kelly, Dr. Herbert C. Clapp, Dr. Roger I. Lee and Dr. Richard Smith. After discussing individual symptoms, these gentlemen agreed upon the following minimum standards in the diagnosis of pulmonary tuberculosis:

"1. When constitutional signs and symptoms and definite past history are absent, or nearly so, there should be demanded definite signs in the lungs, including persistent râles at one or both apices. By 'persistent' it is meant that the râles must be present after cough at two or more examinations, the patient having been under observation at least one month.

"2. In the presence of constitutional signs and symptoms, such as loss of weight and strength, etc., as defined above, there should be demanded some abnormality in the lungs, but not necessarily râles.

"3. Usually a process at the apices should be considered tuberculous and a process at the base to be non-tuberculous until the contrary is proved, excepting when a clear history of pleurisy is present.

"4. A hemorrhage as defined above, one or two teaspoonsful) is evidence of active pulmonary tuberculosis until the contrary is proved.

"5. One should consider a typical pleurisy with effusion as presumptive evidence of tuberculosis. One should also consider a dry pleurisy evidence of slight tuberculosis.

"6. Pain in chest and shoulders, night sweats, digestive disorders, etc., may be present and should be investigated. Fistula in ano should be considered as a tuberculous manifestation, requiring careful examination of the lungs for traces of the disease.

"7. In every doubtful case one should demand that the patient be kept under observation for at least one month, with repeated sputum examinations, before a definite diagnosis is made."

CHAPTER VIII.

SUITABLE AND UNSUITABLE CASES.

After the diagnosis is established it is necessary to decide which cases are suitable and which are unsuitable for sanatorium treatment. Our primary consideration should be whether or not the patient is likely to be more or less permanently benefited by sanatorium treatment. It is useless to attempt to rest this decision solely upon the extent or degree of pulmonary lesion. The clinical symptoms and chances of improvement are often entirely out of proportion to the physical signs. It is this fact that gave rise to Rathbun's classification, as follows:

Lesions.

Incipient.—Slight infiltration limited to the apex of one or both lungs, or a small part of one lobe. No tuberculous complications.

Moderately advanced.—Marked infiltration, more extensive than under incipient, with little or no evidence of cavity formation. No serious tuberculous complications.

Far Advanced.—Extensive localized infiltration or consolidation in one or more lobes. Or disseminated areas of cavity formation. Or serious tuberculous complications.

Symptoms.

A (Slight or none)—Slight or no constitutional symptoms, including particularly gastric or intestinal disturbance, or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.

B (Moderate)—No marked impairment of function, either local or constitutional.

C (Severe)—Marked impairment of functions, local and constitutional.

"This scheme offers definite arrangements, making feasible the exact labeling of any individual case. The following combinations are possible:

"Incipient A.	Moderately Advanced A.	Far Advanced A.
"Incipient B.	Moderately Advanced B.	Far Advanced B.
"Incipient C.	Moderately Advanced C.	Far Advanced C.

"For instance, 'Incipient A' means an individual with an incipient lesion and symptoms characteristic of the incipient stage, as defined above.

"'Far Advanced A,' however, means an individual with a far advanced lesion, but with only incipient symptoms—a combination not infrequently

met with," and one perfectly suitable for admission to and treatment in a sanatorium. Even a "Far Advanced B" case would be suitable for sanatorium treatment, if he were desirable in other respects. In fact, it is not desirable to lay down any absolute or fixed rules or conditions for the choice or rejection of cases.

Generally speaking, applicants with any of the following conditions should be rejected:

Temperature, up to 101° F. or more, every afternoon, unless all other features of the case are very favorable. Attacks of high temperature, 103° F. or more.

Night Sweats, severe, or any other signs of severe mixed infection.

Pulse, habitually rapid, 110 or more when at rest.

Hemorrhages, recent, repeated and profuse.

Weakness and Emaciation, marked.

Dyspnoea, marked on slight exertion.

Laryngitis, tuberculous, severe.

Complications, tuberculous, severe, of bones, glands, testicles, intestines, peritoneum or joints.

Age, over fifty years, where the arteries show marked fibroid changes, and in whom pulmonary tuberculosis is not the chief cause of illness.

Pleurisy, with large amount of effusion.

Any of the following diseases in *sever* form: *Nephritis*, *Cardiac disease*, *Nervous disease*, *Diabetes*, or any other disease which materially impairs the general health. Any *Contagious* or *Communicable* disease (not tuberculosis), any form of *Insanity*, repeated attacks of *Acute Alcoholism*, *Chronic Alcoholism*, *Drug Habit*, marked *Neurasthenia*, a *Criminal* record, bad moral character or a markedly undesirable disposition.

Diabetes is rather a symptom complex than a disease. It is indicative of a vicious disintegrative diathesis involving the liver, pancreas and probably the nervous system. The kidneys are not infrequently involved rather late in this condition, when all important tissues suffer an extreme lowering of vitality and loss of resistance to any infection latent or active. Since tuberculosis is the commonest latent infection in the human tissues, clinical tuberculosis frequently appears as a complication of or in conjunction with diabetes. In those cases where tuberculosis and diabetes combine their devastating influences the prognosis is obviously bad. As a rule no treatment avails. They are not suitable for admission to a sanatorium, except in those rare instances where both the tuberculosis and the diabetes are very slightly developed and the body nutrition is good.

Patients whose teeth are in extremely bad condition should have them attended to before they are admitted. Since the general body nourishment, which depends upon proper mastication, is so essential in the treatment of tuberculosis, it is not necessary to dwell upon the importance of good teeth in this situation. Yet the teeth are not given sufficient attention in this connection by many specialists.

It is not well to encourage the sanatorium habit. The larger the number of new patients treated in the sanatorium, the wider will be the educational influence of the institution. Furthermore, too frequent readmission

of former patients would not be fair to other suitable applicants who have not had the benefit of sanatorium treatment. The well known tendency of a large percentage of healed or partially healed tuberculous lesions to become more or less active, after patients leave the sanatorium and return to unfavorable conditions, has led some to advocate repeated readmission of former patients. There is undoubtedly some good reason for this attitude, so long as special attention is given to the merits of each case. However, in a community sanatorium we have found it inadvisable to encourage the frequent readmission of former patients. Some claim that all patients should be taught to look upon the sanatorium as a haven to which they are invited to return whenever and as often as they feel the need of recuperation. Such an attitude, too generally applied, in a community sanatorium would soon confine the sanatorium's field of usefulness to a very small part of the community. It would tend, inevitably, to shorten the average duration of the periods of usefulness in the lives of those people whose life cycles contain periodic recurrence of sanatorium existence. There are some who can be cured if they remain in the sanatorium continuously for four to eight months or longer. Some of these, often the most useful lives, find it difficult to remain so long away from their usual work and responsibilities. If this class of patients knew that they could return to the sanatorium whenever and as often as they chose, many of them would leave before it was advisable. For this reason, also, it is inadvisable to encourage readmissions.

Above all, we should choose patients who are generally "*worth saving*," and are ambitious to help save themselves, people who will abide by the rules of the sanatorium and discharge their duties cheerfully without complaining. There is no place in a sanatorium for a morose individual or so-called "chronic kicker."

The patient's physician should furnish any information he has regarding the applicant, which would help the examiner come to the fairest possible decision. Every case should be considered upon its humane as well as upon its medical, merits; for, as we all know, tuberculosis is largely a social problem.

On the following page is a copy of a card devised by the writer, which was of considerable aid in facilitating the selection of patients. It was to be filled out by the patient's clinic or private physician and presented to the examiner for the sanatorium. Its wording explains its functions.

Moderately and Far Advanced Cases.—There are a considerable number of people whose sputum is alive with tubercle bacilli, and who travel daily among uninfected susceptible persons. Most of these have moderately advanced, and some far advanced, lesions. They know they have tuberculosis and are making all possible efforts to avoid being a source of infection to others; but can they prevent sneezing or suddenly coughing at times—sometimes when they are close enough to a susceptible person to cause infection? It is impossible. Many of them were told of their disease when it was incipient, and advised to go to a sanatorium. But, being burdened with responsibilities which their conscience would not permit them to drop, they worked on. These people deserve help and the community deserves protection from them. They are usually worthy.

REFERENCE CARD FOR OTISVILLE SANATORIUM

NOTE.—The Otisville Sanatorium of the Department of Health is for uncomplicated, first stage cases of pulmonary tuberculosis. Patients must be in favorable physical condition, of good character and disposition, and residents of New York City for at least one year. See "outfit" card for clothing, etc.; patients should take with them.

(Fill in and sign as indicated)

THIS CARD IS TO BE PRESENTED AT THE DEPARTMENT OF HEALTH TUBERCULOSIS CLINIC
ON (MONDAY) (WEDNESDAY)..... at 3.30 P.M.

Patient's Name..... Address

LATEST RECORDS—At least two temperature records must be given)

[illegible]

Clinical diagnosis and extent of lesion.....

How long under observation.....

Date and hour of first application.....

Present complications (if any).....

Remarks bearing on suitability of patient.....

Sent from (Hospital) (Dispensary)

signed.....

Date, 191

Reference card for Otisville Sanatorium.

Their disease is too far advanced, in most cases, to permit admitting them to the average sanatorium. Admission to a tuberculosis *hospital* in the city is offered and urged, but few accept the offer. They remain an active menace to their own families and to the community at large.

People so afflicted are a highly sensitive class. Their knowledge of conditions in a tuberculosis *hospital*, aided by a very active imagination, makes them rebel at the thought of going there to die. No amount of argument can persuade them to believe that they would ever improve in one of those hospitals. It is this gap, this link missing from the chain, which the sanatorium can fill without impairing its other functions. Though they dread a "tuberculosis hospital," these people look to the sanatorium with hope, which is half the battle. This proverbial hopefulness of the tuberculous person is probably a conservative process on the part of the system, as much as is leucocytosis in septic infection.

Requirements for admission to the sanatorium at Otisville have never been so sharp and restricted as for many other sanatoria, so that it has received quite a number of patients fairly well advanced in the second and some in the third stage. In this way we were able to learn that a surprisingly large percentage of this group showed, after some months, improvement far beyond our expectations. Some even attained arrest of the disease. So striking were these results that the writer decided to admit as many of this class of patients as our limited infirmary capacity would accommodate. Those of this number who did improve were always among our most grateful, well-behaved and creditable sanatorium graduates.

Many of the worst symptoms found in pulmonary tuberculosis, while the patients are in city homes, are due to deleterious physical and mental influences surrounding them. Elevations of temperature, night sweats, severe cough, rapid pulse and marked digestive disorders, with inability to sleep, may all or either be entirely due to or exaggerated by the patient's surroundings. We have seen these symptoms disappear shortly after proper regimen, air, rest, food and hope—especially hope and renewed courage—have been established. All of these they know they will receive at the sanatorium.

Two conditions are necessary to do justice to these worthy people and the community at the same time, through the agency of the sanatorium. (1) The examiner who makes the selection must have good human and medical judgment, and (2), sanatoria must have an infirmary capacity of from 15 to 20 per cent. of their total capacity.

To avoid disturbance of the sanatorium conduct, standards and general cheerfulness, all patients admitted to the sanatorium should go directly to the Reception Unit. They would be seen by a physician of the resident staff as soon as they arrived. Their temperature, pulse and general condition should be determined and noted. The physician should then assign them to one of the reception shacks, or to the infirmary, as their condition indicates. Those admitted to shacks should remain there, under close observation and instruction, for two or three weeks. By this time a fair estimate of their condition and physical capacity is obtained. They

should then be transferred up the hill to the sanatorium proper, with a brief memorandum to the Resident Physician of their proper unit. Those patients who are found in a condition not satisfactory for transfer to their permanent unit after two or three weeks should be retained in the reception shacks or transferred to the infirmary of the reception unit; according to the judgment of the Physician-in-Charge. Later, when their condition warrants, they should be transferred up the hill to their proper unit. As fast as patients in the infirmary improve sufficiently to be up and about and follow the daily routine of exercise they should be transferred up the hill to their respective units. In the event of the development of any contagious disease in a new patient (and two weeks is ample time for this), he or she should be at once placed in the isolation pavilion, and all other rational precautions against spread of the infection taken. Thus the chances of introducing infectious (other than tuberculous) diseases into the general sanatorium are far less than they are where the patients are at once admitted to their proper units upon arrival.

Patients once up the hill, in their proper units, need never be transferred back to the reception infirmary, except for rare and extreme reasons. In cases of ordinary intercurrent illnesses they would be cared for in the infirmary of their proper unit. The movement of patients is always up hill, in the hopeful direction towards improvement and discharge. By this arrangement practically all deaths occur in the infirmary of the Reception Unit, in one of the isolation rooms, so that these unavoidable occurrences and their depressing influence is not brought to bear upon the general patient body. It should be arranged so that one of the resident staff would have some special training and experience in the performance necropsies. Many interesting and instructive autopsies could be obtained, which are now almost never done in sanatoria. This postmortem study and evidence could be compared with recorded physical findings with great profit. Such a proceeding would be of inestimable value to our knowledge of tuberculosis.

Every community is, in a measure, enriched according to the knowledge and experience of its physicians. Therefore, municipal sanatoria of large cities, where the great number of patients supply unlimited opportunity for observation and study, should be so complete in the various stages of the disease and its complications, with facilities for studying it during life and at autopsy, that they would be virtually post-graduate schools, from which the entire community could draw competent and well versed experts.

CHAPTER IX.

WAITING LISTS, PATIENTS' OUTFITS AND MODUS OPERANDI OF ADMISSIONS.

Fairness to applicants demands that the examiner accept or reject them with as little loss of time as possible. Waste of time in academic or impractical investigations, or through political or other red tape, is inex-

cusable. The vast majority of cases should be accepted or rejected immediately upon completion of the medical examination, and this examination should be performed as soon as it is possible to obtain the briefest necessary data. The accepted cases should then be placed on "waiting lists," in the order of their acceptance. It is obviously necessary to keep these lists, one for men and boys, one for women and another for children. The latter list, that for children, should contain all girls of 14 years and under and boys under eight years of age. Those whose names have been placed on the waiting lists should be admitted in the order of their acceptance, except where special conditions make it just and advisable to deviate from this order of rotation. In rare cases, where the patient's condition, or home conditions, would render any delay peculiarly hazardous to the patient or to others, exception should be made and they should be admitted as early as possible, ahead of less urgent cases, disregarding the order of the lists. It is wise to have recommendations for such exceptions submitted to the supreme authority in charge of the sanatorium, for approval, before the patient is admitted. If the medical examination and acceptance or rejection are accomplished as promptly as possible after the application for admission is filed, the order of the names on the waiting lists will coincide very nearly with the order of applications. Since delay in the final decision is, as it should be, due almost exclusively to delay or negligence on the part of the patient, and therefore in the least urgent cases, it is obviously neither wise nor just to arrange the waiting lists in the order of application.

When the sanatorium is of considerable size there is never any legitimate excuse for a delay of more than a few days in admitting a deserving and urgent suitable case. Ordinary intelligence should render delay in such cases impossible. Even if no vacancies exist at the sanatorium, there are always a few patients whose length of stay, personal and home conditions make it possible to discharge them without danger or injustice. The surest test of efficiency of those in charge of a sanatorium is the completeness with which they keep their beds filled with cases which return the most needed and deserving benefit to the patients and the community. If this is to be accomplished to the highest possible degree, no set rule of procedure can be permitted to outweigh intelligence in exceptional situations. It must be kept in mind that the conduct of a sanatorium, including the admission of patients, is one branch of the practice of medicine, and the practice of medicine can never be successfully set to inviolate rules.

In the case of a municipal or state sanatorium it might be claimed that, to avoid improper favoritism, no exceptions from the order of the waiting lists should be made under any circumstances. When the exceptions are made only upon the approval of the Commissioner of Health or his deputy, after recommendation with reasons by the examiner, even the faintest suspicion of impropriety would be obviated. As long as human beings inhabit the earth there will be some to charge corruption in every city or state agency, no matter how properly they may be conducted. This seems to be the best way to convince voters that those in office should be removed to make place for those who make the charges. It

is at once the cheapest and most commonly employed campaign ammunition. Physicians who are fortunately rarely interested in political changes must not be discouraged if their sincerest efforts are, at times, entangled in such calumnies. However, the writer's experience, while examining applicants for admission to the New York City Municipal Sanatorium for six years, goes far to prove how unfounded is the fear that favoritism or undue influence is likely to be attempted in this work. Not once in this time was he approached in an effort to influence his judgment in making selections, or to urge unjust haste in making admissions. Certainly New York City would provide examples of undue influence, or attempted influence, if any city would. It is large and varied enough in population to provide examples of almost anything in human nature.

Patients' Outfits.—When a patient is informed that he or she has been accepted they should be told when, approximately, they will be admitted and, also, they should be notified regarding the outfit they must have to carry with them.

There is no occasion for a patient to carry a trunk to a sanatorium. A suit case or valise will hold all the clothing necessary. Since trunks require a large storage space, patients should be forbidden to bring them, and explicitly informed accordingly.

The outfits vary with the sex of the patient. Every male patient should provide himself with at least 2 suits of clothes (light and heavy), a sweater, cap, hat, overcoat, 4 top shirts; 3 under shirts, 3 under drawers, 2 pairs of shoes, over-shoes (arctics in cold weather), slippers, 2 suits of pajamas, bath robe, 4 pairs of socks, gloves, shaving outfit (except boys), tooth brush, hair brush and comb, 2 face towels, 2 bath towels, overalls, tooth powder or wash, soap and a suit case. A thin strip of stockinet or jersey, called "The Black Knight," to put over the eyes, is helpful to those who have difficulty in sleeping in the open when the early morning light appears. A woolen night cap, which covers the head, ears and chin, is almost necessary in cold climates. Thick woolen sleeping socks should be in the outfits in very cold climates. These latter articles are, of course, as necessary for female as for male patients.

The outfit for female patients should contain at least a sweater, hat, cap, coat, gloves, 3 waists, a skirt, 2 petticoats (light and heavy), 1 or 2 dresses, 2 underdrawers (light), 2 underdrawers (heavy), 3 undershirts, 2 or 3 corset covers, 4 pairs of stockings, 2 night dresses, bath robe, 2 pairs of shoes, rubbers (artics in cold climates), tooth brush and other toilet articles, 4 face towels, 2 bath towels, heavy bed socks, slippers and suit case.

All articles in every outfit should be plainly marked with the owner's name.

Modus Operandi of Admissions.—In the case of every applicant who is rejected, their card of record should be so marked by the examiner, with a clear statement of the cause for rejection. If the rejected patient was recommended by a physician, clinic or hospital, the nurse, secretary or clerk in charge of records should notify the recommending party of the examiner's decision, quoting the reason for rejection. If they have volun-

tarily applied, the rejected applicant should be informed and advised according to the reason for rejection.

Those patients, except children, who have been accepted should remain until all examinations of the day have been completed, to be addressed by the examiner. Besides handing each of them a list of their outfits, the examiner should inform them clearly of the fact that they have tuberculosis. He should also inform them that work is to be an essential part of their sanatorium treatment. He should tell them that, though they must all agree to stay not less than three months in the sanatorium; in case the physicians find it necessary they must be prepared to remain longer.

It would certainly seem that any adult who had been accepted for admission to a tuberculosis sanatorium would know that they have tuberculosis, but it has been our experience that not a few patients in sanatoria profess ignorance of the fact. This either real or feigned ignorance is often used as an excuse for evading sanatorium rules or for making themselves a nuisance generally. They should be so clearly informed by the examiner, and so impressed with the absolute necessity of following, to the letter, all rules and advice given in the sanatorium that no thread of excuse can remain for such an attitude after they reach the sanatorium. The examiner should also tell them at this time of the necessity of being on hand, at the appointed hour and place, with their outfits complete, in a *suit case* (not a trunk), to go to the sanatorium. They should be informed that, if they are not on hand and ready, their names will be put at the bottom of the waiting lists. Their names should be so placed, unless a valid excuse for their failure to appear, properly outfitted and on time, is discovered. Discipline, which is so essential to success in sanatorium conduct, should begin the moment the patient is accepted.

There should be regular admission days, twice a week. Days for discharges should also be twice a week, the same as those for admissions. Patients should be discharged from the sanatorium in the forenoon and admitted in the afternoon. They should be admitted and discharged in groups, and always attended, to and from the sanatorium, by a nurse or a physician. Whenever it is decided to discharge an extremely ill patient he or she must always be attended to his or her destination by a physician. Only in exceptional cases and for good reason should patients be admitted or discharged singly or unattended in the case of municipal sanatoria. In the case of state sanatoria such exceptions must, of course, be rather frequent, since the patients come from so many different points. The regular admission and discharge days should be observed, however, for the maintenance of a workable routine in the institution.

When the accepted patients assemble for their trip to the sanatorium, their outfits should be closely inspected by the nurse in attendance. No prohibited article, especially alcoholic drinks and patent medicines or other medicines, should be left in the outfits or in the possession of the patients. Every patient's temperature and pulse should be taken and recorded, and they should be inspected by a physician. No patient under the influence of alcohol should be allowed to go. Any patient with high temperature,

extremely rapid, weak or irregular pulse, marked dyspnoea, spitting blood, or whose condition from any cause is, in the judgment of the inspecting physician, hazardous, should not be permitted to go, but should be put to bed in a hospital or taken to their home and put to bed. As stated, those who are in proper condition and properly outfitted should be attended to the sanatorium by a nurse or physician.

Upon arrival at the Reception Unit of the Sanatorium their temperature and pulse should be taken. Then, after they have been seen by a resident physician and assigned by him to the Reception shack or Infirmary, they should be served with hot broth and toast or a thin sandwich. Their first impression should be as pleasant as it can be made, for it may color their entire conduct and progress in the sanatorium. All of these formalities should be accomplished promptly and pleasantly. Waits or harshness of manner are peculiarly discomforting to a stranger in a strange place, especially if the stranger be ill.

CHAPTER X.

PATIENTS ROUTINE.

When the patients arrive and are inspected by the Resident Physician-in-Charge, or another resident physician. Any who have a temperature of 101° F. or more, pronounced dyspnoea or cyanosis, a pulse of 120 or more, or any other acute illness or suffering, should be put to bed in the infirmary at once. The remainder are assigned to the reception shacks. The duration of a patient's stay in the infirmary depends upon the progress of his or her condition. The others should remain in the reception shacks two or three weeks, under intensive observation, unless symptoms arise necessitating their transfer to the infirmary in a shorter time. Some patients of peculiarly sensitive nervous systems may be found to have a temperature above 101 on arrival and be put to bed in the infirmary, but will return to normal or nearly so within twenty-four hours and remain so thereafter. These patients should be transferred to the reception shacks as soon as it is determined that their temperature was a purely nervous manifestation incident to the journey and strange experience.

Infirmary patients are treated according to their symptoms and progress. But even here care should be exercised to see that they enjoy the greatest possible amount of free air, no matter what their symptoms.

The routine followed in the reception shacks can be followed by all, practically without exception. During their two or three weeks in these shacks they learn what they are to do and the physician learns what they can do. It must be a period of intensive study on the part of both physician and patient. As the patients enter the reception shacks they should be received by an orderly, who assigns a locker to each patient. The patient's suit case, still packed, is placed on the floor in front of his or her locker. After they have washed their faces and hands, drying them with paper towels, the orderly gives each of them a piece of gauze, for a handkerchief, and a sputum box or cup). He also informs them briefly

that the use of the cup is obligatory.* Then the patients sit on the porch, or in the reception room in stormy weather, where they are served refreshment, broth and toast or sandwiches. They rest here until supper is served in the dining halls at 6 or 6.30 p. m. Before going to supper they wash their faces and hands and clean their teeth.

After supper they return to the shack and rest until 7 or 7.30. They then unpack their suit cases, placing the contents in their respective lockers. Three empty suit cases are turned over to the orderly and stored, each patient receiving a check for same. Any small valuables which a patient does not care to keep with him or her should be deposited at the office of the Physician-in-Charge and a receipt given for them. The orderly then takes each patient's social history, temperature, pulse and respiration. The patients take a bath, clean their teeth and are weighed in their night clothes, after which they retire to their bed on the sleeping porch. The next morning, after breakfast, the patients must be instructed in how to make their beds. This instruction is given by previously admitted and instructed patients. It is best to have the orderly, on duty in the reception shack, a former patient (or even an active patient) who will live with the new patients, on the same sleeping porch, and do everything that is required of them. In this way, as Dr. Edward S. McSweeney has well-said, he teaches them by example, as well as by speech, the life they must live.

The following is a brief summary of the routine followed in the reception shack at the Otisville Municipal Sanatorium. This routine we have gradually perfected after years of study and effort, and it seems to meet the situation. A slight variation in hours might be found advisable, to suit the seasons.

ROUTINE FOLLOWED IN RECEPTION SHACK.

First Two Days.

Wash hands, face and clean teeth before and after each meal as long as in shack.

Temperature, pulse and respiration taken every two hours, from 8 a. m. until 8 p. m.

Patients may shave any day between the hours of 1 and 2, except Sunday. Rise at 6.30.

Breakfast, 7.30 to 8 a. m.

Change sputum box and gauze at Germicide House.

Make bed.

At 8.45 recline on steamer chair until 12.15 on sleeping porch.

Rounds by Resident Physician at 10.30.

Nurse inspects and takes inventory of clothes and belongings of new patients at 11.30. If anything, such as medicines, etc., be found they are taken from patient and returned when he leaves institution.

Dinner, 12.30 to 1 p. m.

* NOTE.—These cups are numbered with a number which applies to the patient throughout his or her stay in the sanatorium.

Recline on steamer chair on sleeping porch from 2 to 5.15 p. m.
Supper, 5.30 to 6 p. m.
Write letters, mend clothes, read, etc.
Retire at 8 p. m.

Routine for Next Four Days.

On Sunday sputum and urine bottles are given to patients for specimens.
Instructed in use of same. Collected and sent to Laboratory Monday a. m.
Temperature, pulse and respiration taken at 8 a. m. and 4 p. m. for the remainder of time in shack.
Retire at 7.30 p. m.
Otherwise the routine is the same as first two days.

Seventh to Tenth Days.

Patient is assigned some house work, not to exceed one hour, which is done on return from breakfast. (Sweep and mop porches and other rooms, oil furniture, polish brass, etc.)
Recline on steamer chair on sleeping porch from 9.15 until 2.15.
Otherwise routine same as previous days.

Eleventh to Fourteenth Day.

Begin walking exercise, ten minutes in morning and ten minutes in afternoon, increasing ten minutes each day. Friday, the last day, at the finish of afternoon one-hour walk, the patients are inspected by doctor.
Otherwise routine same as previous days.
At this point the patients whose conditions are satisfactory should be transferred from the Reception Unit to their proper units up the hill, or to their regular shacks in the case of smaller sanatoria with no Reception Unit.

Fifteenth Day.

Assigned to peeling vegetables from 9.30 to 11.30 a. m. and 2 to 4 p. m.

Sixteenth Day.

Assigned as waiters or to general gang.

As Waiter—

Arises at 6 a. m.

On duty at Dining Hall 6.30 to 8 a. m.

Return to shack; do house work;* cure on porch 9.15 to 11.15 a. m.

On duty at Dining Hall 11.30 to 1 p. m.

Return to shack; cure on porch 2 to 4.15 p. m.

On duty at Dining Hall 4.30 to 6 p. m.

Return to shack. Recreation until 7.30 p. m.

Retire at 7.30 p. m.

* No dry sweeping nor dry dusting should be permitted in a Sanatorium. All interior finishings should be smooth, varnished or painted, with as few corners or crevices as possible, and cleaned daily with moist cloths or mops. It is usually best to have all floors rubbed lightly every day with oiled mop. Bedsteads, tables and chairs should be cleaned with moist cloth every day. Lockers, as well as toilets and wash stands should be cleaned and minutely inspected every day.

General Gang—

Same as seventh to tenth days, except work on general gang from 10 to 12 a. m. and 2 to 4 p. m. The general gang does any work in shacks or about the grounds, deemed advisable by the Resident Physician.

First Friday, lecture by Resident Physician-in-Charge on Sanatorium and general advice to the patients, encouraging an intimate talk.

First Friday and Saturday history is taken, and physical and chest examinations are made by doctors.

Monday, vaccinated at 10.00 a. m.

Tuesday, Schick test is made at 10 a. m.

Wednesday, Wasserman and Widal tests are made at 10 a. m.

Tuesday and Thursday, bath days for all patients.

Friday, change day for bed linen; also personal wash received. Clothes to be washed are given in Saturday.

Before starting, and on completion of all exercise, the patients should be carefully inspected by a physician, to avoid possible injury to a patient by exercise. The physician should record briefly the result of this inspection, just marking "O. K." or "Negative" in those who present no dyspnoea, cyanosis, haggard or worn appearance or have no pain. Any abnormality observed or complained of should be noted. If there is any question in the physician's mind concerning advisability of continuing the exercise, it should be discontinued until the patient's condition improves. One should, however, be always on the lookout for maligning. This should not be tolerated. Later on, when the patients are assigned to actual work, besides being under the more or less constant observation of the supervising orderly, they should be inspected once a day by a physician, when at work. Feigned inability to work, from one excuse or another, is commonly seen in charity sanatoria, and must be sternly overridden, if we don't wish the institution to become a veritable drone factory.

The Resident Physician-in-Charge should never fail to give each group of new patients the encouraging and instructing talk, already referred to, before they leave the Reception shack. He should tell them the importance of acquiescence in the sanatorium rules and life. The great and almost certain lasting benefit they will receive if they follow instructions in the proper spirit. Also they must be impressed with the absolute impossibility of retaining them in the sanatorium if they are disobedient or fail to cheerfully adapt themselves to their new situation. He should finally impress them with the fact that they are among friends, especially the doctors and nurses, to whom they should appeal or talk regarding any matter of importance to them and for any kind of advice. He should then hand each a copy of rules for the patients. Those given below are what we have formulated at Otisville and would seem to cover, with slight modifications or additions for peculiar situations, any community sanatorium.

Rules and Regulations for the Patients of the Municipal Sanatorium.

1. On admission each patient is given sputum cup and gauze handkerchief. The number on the sputum cup is the patient's number while at

the sanatorium and this number will be stamped on their personal linen. Sputum cups and gauze handkerchiefs shall be changed each morning immediately after breakfast. Sputum cups are to be carried by patients at all times and in an upright position. If cup is at any time accidentally upset, the shack captain should be immediately notified. Always hold gauze handkerchief in front of your mouth when sneezing and coughing and always spit into your cup. Spitting on the grounds, floors or in fact anywhere except into your cup means instant dismissal from the sanatorium.

2. All money and valuables should be brought to the office where a receipt will be given for them. The sanatorium will not be responsible for losses, due to failure to observe this rule.

3. Patients are furnished with a locker in which is to be kept their necessary wearing apparel and toilet necessities. There is a general store-room under the Dining Hall where patients will keep their extra clothing.

4. Patients, unless excused by a hospital physician, must perform the routine prescribed for them, which includes attendance at meals, exchange of sputum cups and housework. Each patient whose condition allows will be given as a part of their treatment a definite amount of exercise or work, or both at a set time. No exercise or work must be performed except as prescribed or permitted by a physician, nurse or orderly.

5. The only time that patients are permitted, even in winter, to be in the sitting rooms is when dressing after arising, and undressing before going to bed, in preparing for meals, not to exceed thirty minutes at each meal time, and evening hours in the sitting rooms from six to nine o'clock. The evening hours for patients in the reception and substandard shacks from six to seven-thirty.

6. On Friday morning, immediately after breakfast, patients will turn in their soiled institutional linen to the laundry representative under the dining hall who will give them a receipt which upon presentation to the linen room will entitle them to a clean set of linen, at the same time they will receive their clean personal clothing which has been returned from the laundry. On Saturday morning, immediately after breakfast, soiled personals are received, consisting of pajama coats, pajama pants, or night shirts, combinations and socks (stockings and undergarments, in the case of women), by the representative of the laundry, in the same place.

7. All patients are required to take the prescribed number of baths weekly, never less than two, and when limited to this number, an interval of three days must have elapsed between baths.

8. Patients are not allowed to go beyond the limits of their respective units without special permission of the Resident Physician. Walking on the roads by patients is not permitted after dark. Permission to leave the sanatorium grounds will only be granted when the request has been made at least twenty-four hours prior to the time patients wish to leave. Patients are not to ask for permission to leave the sanatorium grounds unless the reason for doing so is very urgent, for under other conditions the request will be refused.

9. Patients having visitors shall receive them in the Recreation Hall

where they will register their names and under no circumstances will they be permitted to visit patients' pavilions with the exception of the Infirmary, unless permission to do so is granted them by the Resident Physician. No meals will be furnished to patients' visitors. Patients will not be allowed to accompany visitors off the sanatorium grounds and should not ask to do so.

10. Social intercourse between male and female patients is strictly prohibited except at entertainments, dances, etc. Letters or notes are not to be exchanged between patients of the two units.

11. Patients can receive their mail at the Post Office between 9 and 12.30 a. m., 2 and 5.30 p. m. and 6 to 7 p. m. Contents of all incoming and outgoing packages must be submitted to the postmaster for inspection before leaving the post office.

12. All changes of address shall be reported to the office of the Resident Physician immediately.

13. *Patients' Daily Schedule:*

First rising bell, 6 a. m. (for waiters on first table).

Second rising bell, 6.30 a. m. (for ambulatory cases).

First breakfast, 6.45 to 7.15 a. m. (waiters, pantrymen and drivers).

Second breakfast, 7.30 to 8 a. m. (patients).

Gauze and sputum cups changed immediately after breakfast each morning.

Morning rounds by physicians, 9 to 10 a. m.

Various work assignments, 10 to 12 m.

First dinner, 11.45 to 12.15 m. (for waiters, pantrymen and drivers).

Second dinner, 12.30 to 1 p. m. (patients).

Rest hour, 1 to 2 p. m.

Various work assignments, 2 to 4 p. m.

Rest and recreation, 4 to 5 p. m.

First supper, 4.45 to 5.15 p. m. (for waiters, pantrymen and drivers).

Second supper, 5.30 to 6 p. m. (patients).

Rest and recreation, 6.30 to 9.15 p. m.

First retiring bell, 9.15 p. m.

Second retiring bell, 9.30 p. m. (all lights out).

14. Hands must be washed before and teeth brushed after each meal.

15. Patients are requested to always be on time for their meals.

Dining Room doors will be closed at 7.35 a. m., 12.35 p. m. and 5.35 p. m.

16. Before entering the Dining Hall, patients will place their sputum boxes in the sputum box rack placed at the entrance. Patients are requested to remove their hats and coats and to place them on the coat racks before entering the Dining Hall.

17. Patients will remain in their places till the bell sounds at the close of each meal. They will then pass out in a quiet, orderly manner.

18. Loitering in the Dining Hall after bell has rung is forbidden.

19. Food or dishes are not to be taken from the Dining Hall without an order from the dietitian.

20. Waiters are not to come into the Dining Hall before the bell rings for them at 6.30 a. m., 11.30 a. m. and 4.30 p. m.

21. Gambling, drinking, foul or profane language, boisterous or offensive conduct, the use of medicine not prescribed by the doctor, keeping pets, injuring trees, damaging or defacing buildings or any other Department property is forbidden.

22. Patients will not be allowed to smoke unless given permission to do so by the Resident Physician and will only be allowed to smoke during the hour which follows each meal. Smoking in the buildings of this sanatorium, with the exception of the west end of the Recreation Hall, is strictly prohibited.

23. Any unusual happening or complaint must be reported to the Resident Physician or representative in his office, and will receive immediate attention.

24. Patients must rest on their beds for one hour after dinner. There must be no talking or reading during this rest period.

25. The Recreation Hall is open for the use of patients from 9. a. m. to 8 p. m. Books can be obtained by patients from the Librarian from 9.30 a. m. to 12 m., 1.30 p. m. to 5.30 p. m. and from 6 to 7 p. m.

26. Patients are allowed to attend religious services provided their physical condition permits. Patients wishing to attend religious services at the Women's Unit will register their names with the clerk in the supervisor's office.

27. Dry sweeping or dusting, brushing or shaking of clothes in the patients' pavilions, driving nails, screws or hooks, adding new shelves or furniture or decorating the walls is forbidden.

28. All patients are absolutely forbidden to tamper with furnace fires or any valve or mechanical appliance controlling light, heat and power.

29. All papers must be tied in bundles and put in bags provided for them. Remains of fruit, etc., and broken glass must be put into separate cans provided for that purpose.

30. Patients are cautioned to be extremely careful in the use of their clinical thermometers when they are assigned to them. Should they be broken through careless handling, patients will be expected to replace them.

31. Patients should always be careful in the use of hospital property loaned them during their stay here. Patients who have asked for their discharge from the sanatorium will bring to the Linen Room, the afternoon before leaving, at 4 o'clock, hand towels and laundry bags, fur coats and arctics, if such have been provided. On the morning of their discharge, they will return their night caps, drinking cups, tooth brush holders, and bath towels.

32. Patients must keep their shacks and grounds surrounding them neat and orderly at all times.

33. Patients will be expected to obey these rules.

IMPORTANT FACTS EVERY TUBERCULAR PATIENT SHOULD KNOW AND
OBSERVE.

1. Tuberculosis of the lungs or consumption is curable.*

* NOTE.—The word "curable" is justified in this position. A full explanation would be confusing and discouraging to many patients.

You have been admitted to this Sanatorium after examination by the Clinic doctors of the Department of Health, because they consider you a favorable case either for cure or for the arrest of your disease, depending upon its activity and the amount of lung affected.

That the greatest amount of good will result to you during your stay here, the following rules are laid down for your help and guidance:

2. *Most prominent symptoms of tuberculosis of the lungs:*

Cough.

Always hold your gauze handkerchief over your mouth when sneezing and coughing. You will thus avoid giving the disease to others who might contract it because of your carelessness. When patients cough or sneeze they spray the air for a considerable distance with tubercular germs which may be inhaled or get on the clothing of persons nearby. *Fight your cough back.* The fact that you feel a tickling in your throat is no reason for you to cough. Cough only to raise sputum from your lungs and restrain all other coughing. If you do this, you will find at the end of the first week you are here that you do not cough more than half as much as you formerly did.

Rest your lungs by coughing as little as possible. Your cough may be due to nose or throat trouble, in which case you will receive appropriate treatment for it. Breathe through your nose *only*. Do not take breathing exercises unless advised by one of the Sanatorium physicians to do so.

Spitting.

Always carry your sputum box wherever you go and spit into it and not into your gauze. The use of handkerchiefs by patients is strictly forbidden. If you spit on the grounds, floors or anywhere except into your sputum box, you will be discharged at once. The tubercular patient is not a menace in himself but becomes so when he is careless in his habits. Tuberculosis is spread and has been made the great plague that it is by the criminally careless tuberculous patient. Never swallow your sputum. To do so, is not only a filthy habit, but is very liable to cause tuberculosis of the stomach and intestines.

Blood in Sputum.

If you at any time raise blood notify the shack captain or nurse at once and lie quietly on your bed until seen by the doctor.

Shortness of Breath.

Patients should not run, walk fast, shout or sing.

Pain.

Always report chest pains or any other symptoms you are suffering from to the doctor when he makes rounds, and at any other time to the nurse or shack captain who will notify the doctor.

TRY TO CULTIVATE A CHEERFUL DISPOSITION AS IT WILL HELP YOU TO GET WELL.

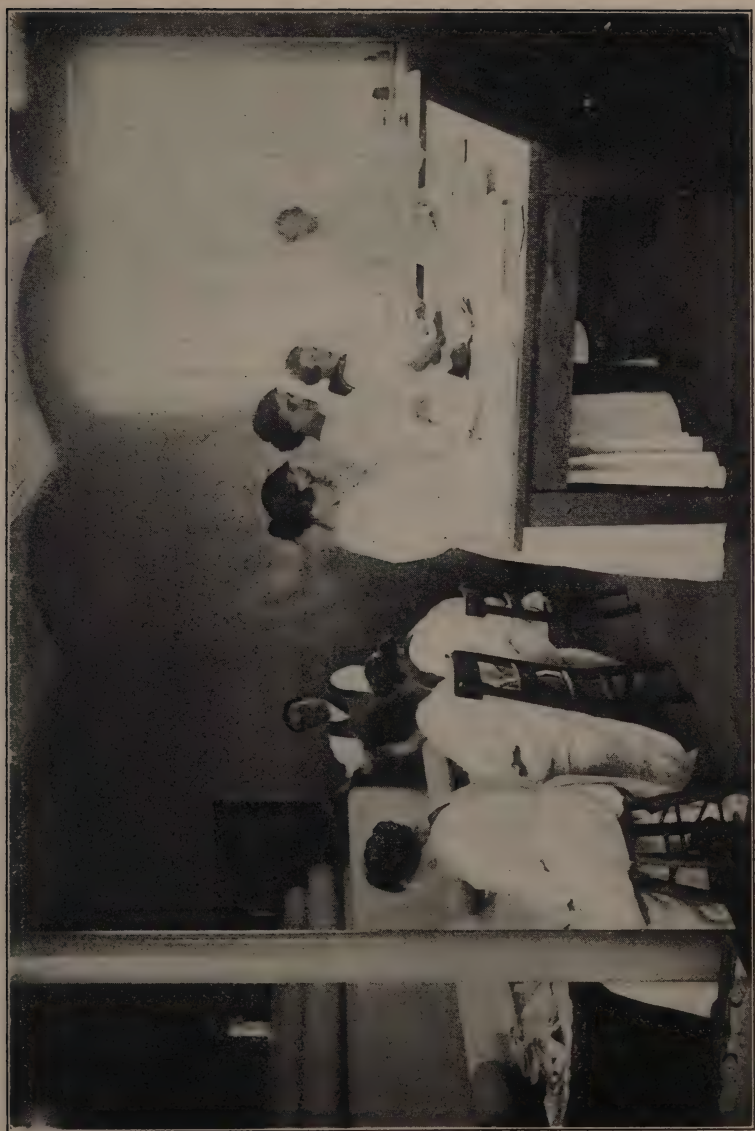
CHAPTER XI. WORK AND EXERCISE.

For various reasons, rational and irrational, exercise has been advised by some clinicians in tuberculosis as far back as history records. As

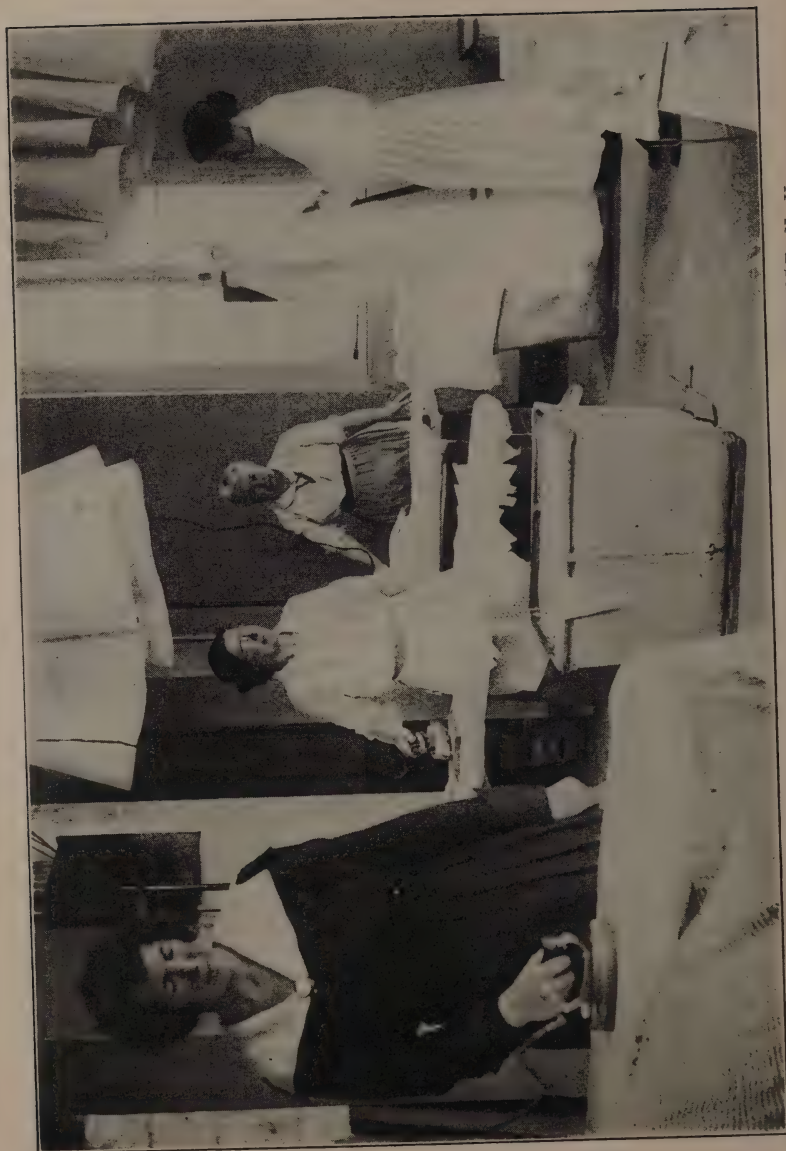
we have seen, the first physician to recommend definitely, prescribed exercise in the open air based his advice and practice upon a belief that tuberculosis was due to a congenitally small heart. Therefore, in view of the irrational basis, the exercise was not properly related to the disease. After Villemin's work on tuberculosis, Weigerts and Ehrlich's on dyes and staining and Pasteur's on the bacteriology of infectious diseases, discovery of the tubercle bacillus and a full understanding of the effects of its growth in the human body waited only upon time and perseverance. Villemin's work left us, in tuberculosis, where we now stand in yellow fever. Someone will probably isolate the specific germ of yellow fever, as Koch isolated the tubercle bacillus, by following the blazed trail with perseverance and close attention to detail. After Villemin's work the management of tuberculosis should have been as intelligently applied as now, but the medical profession has always been a slow pupil.

Before the last quarter of the nineteenth century and even later, much absurd advice concerning exercise and air was given to consumptives by otherwise well-informed physicians. Some of this advice we now know was distinctly injurious to the sufferer and often led to the spread of the disease. Exercise was often carried to great lengths, in the belief that the general strength and appetite must be thus maintained. No doubt many an acute case with fever was placed beyond possible arrest and a fatal end hastened by over-exercise prescribed by a physician. Patients were sent west to high altitudes and advised to keep moving about regardless of symptoms. In other cases, too weak to leave their beds, the windows were kept tightly closed, excluding all air, an equally injurious measure, and one that made spread of the disease to others a practical certainty. Rest in the open air was about the only advice that seems never to have been advocated in febrile cases, before the advent of the tuberculosis sanatorium. It is now known that this is about the only way that acute symptoms (meaning activity in lesion) can be relieved. Even nourishment cannot be satisfactorily improved until activity has been checked by absolute rest in open air. It is, therefore, clear that neither exercise or work should be done by patients with elevation of temperature or other symptoms, such as pain, marked dyspnoea, marked bodily weakness, excessive cough, blood in sputum or very rapid pulse. In the sanatorium no work should be assigned to a patient until he has been under observation in the reception shack long enough to make a good estimate of his ability and fitness for the work assigned.

In order to determine their ability to perform any work, without injury, it is best to put them through some gradually increasing daily exercise. Walking is probably the best and pleasantest. There should be a course laid out with a post every hundred yards. Each post should be marked with the number of minutes required to walk to it, from the starting point, at a moderate pace. When the course is up hill the time allowed should be proportionately more than that allowed when on the level or down grade. On the first day ten minutes walking, twice a day, is enough. This should be increased by adding five minutes each day,



PATIENTS WORKING ON MANGLE IN LAUNDRY, MUNICIPAL SANATORIUM, OTISVILLE, N. Y.



PATIENTS IRONING, LAUNDRY, MUNICIPAL SANATORIUM, OTISVILLE, N. Y.



HENNERY ATTENDED TO BY PATIENT WITH ARRESTED DISEASE. MUNICIPAL SANATORIUM,
OTISVILLE, N. Y.



PIGGERY ATTENDED TO BY PATIENT WITH ARRESTED DISEASE. MUNICIPAL SANATORIUM,
OTISVILLE, N. Y.



CUTTING ICE FROM SANATORIUM RESERVOIR.

until they walk one hour twice a day. Patients should walk two to three miles an hour, according to the grade of the course. During these two weeks, those patients who develop dyspnoea, rapid pulse, elevation of temperature, blood streaked sputum, or signs of general exhaustion should discontinue the walking and try it again later. Those who stand the course perfectly well should be transferred from the reception unit to their proper units. The Resident Physician-in-Charge will now be sufficiently acquainted with them to, with the aid of the orderly in the



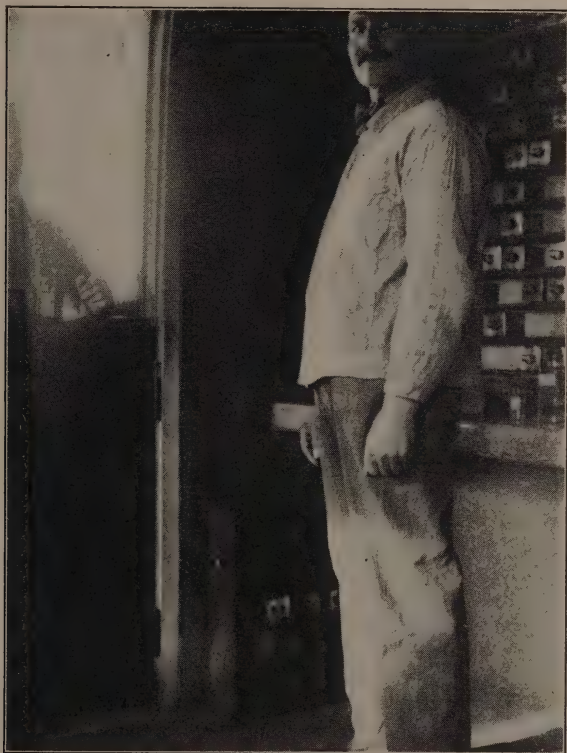
PATIENT EXCHANGING SPUTUM CUP AT GERMICIDE HOUSE, OTISVILLE.

reception shack, assign them to shacks in groups most congenial. Contentment among the patients is more dependent upon their grouping in the shacks than any other single factor.

It is a good policy to appoint the most reliable patient in each shack "shack captain." The shack captain is responsible for the conduct of the patients in his or her shack. He or she is also responsible for the order and cleanliness of shack, beds and lockers, and immediate grounds. He is required to report infractions of any sort. His or her duties

should be briefly typewritten and posted on the wall of the shack dressing-room, so that other patients will not attach unfair censure to his or her authority and actions.

Next comes the assignments of work. Except for temporary symptoms, every patient outside of the infirmary or reception shack should do some useful work, in addition to his or her share of keeping their own shack in order every day. Peeling and preparing vegetables, and waiting on tables should be done periodically by all patients. No other work is so conducive to democratic fellowship, an



INTERIOR OF GERMICIDE HOUSE, IN CHARGE OF A
PATIENT—OTISVILLE.

atmosphere essential to the success of the institution. Other assignments should be made to accord, as closely as possible, to the previous habits of work and inclinations of the individual patients. In small sanatoria, the patients can wash the dishes, but it is the writer's opinion that in large institutions where mechanical washers with much attendant steam is unavoidable, this work is best done by permanent employees. This policy is best for both the patients and the dishes. Besides work in the dining



PATIENTS IN "GENERAL GANG" WORKING ON SANATORIUM GROUNDS, OTISVILLE.



PATIENTS WORKING IN VEGETABLE GARDEN, OTISVILLE.

hall and shacks, already mentioned, patients can be assigned to the following: Tending fires, driving horses or automobiles, laboratory assistants, carpentering, clerking, typewriting, telephone exchange, cleaning grounds, cutting grass, flower and vegetable gardening, ditching, road, walk and wall building, attending cows (those who have no cough or sputum), care of pigs, care of chickens and pigeons, or other animals, plumbing, printing and bookbinding, librarian, drug room, linen room, patients' store and post office, laundry, tailoring and mending, hair cutting and shaving, shoemaking, assistant orderly, messenger, watchman and, in fact, any work for limited hours so long as they are observed and seen to develop no unfavorable symptoms therefrom.

Under the writer's observation and advice, Dr. Edward S. McSweeney, who was then Resident Physician-in-Charge, perfected a plan of patients'



PATIENTS DOING MICROSCOPICAL WORK IN
DIAGNOSIS LABORATORY, OTISVILLE.

work at the Otisville Sanatorium. This was the first really consistent application of patient labor to the entire conduct of a tuberculosis sanatorium. Although we had begun this plan when the sanatorium was opened in 1906, while Dr. F. P. Howser was our resident physician-in-charge, and kept it up continuously, it was brought to its highest value, economically, as well as therapeutically, under Dr. McSweeney. Patients had been assigned manual labor in England before 1906, but before our undertaking they had never been relied upon for any great part of the work essential to the conduct of the sanatorium. Dr. McSweeney's paper on "The Medical Conduct of the Otisville Sanatorium," which appeared in the June, 1910, number of the *New York State Journal of Medicine*, gives a splendid account of the working plan at Otisville.

A patient's moral tone is distinctly elevated by the realization that he is returning some equivalent for benefits received; just as it is lowered

by prolonged inert dependence. This alone is ample reason for having able-bodied patients do useful work.

It is quite unknown for a patient to ask to be excused from exercise that serves no useful purpose in addition to the bodily benefit. In those sanatoria where exercise, under medical direction, is directed to useful work, it is customary to have several patients insist upon being excused every day. There is now little or no dissent from the opinion that graded exercise is beneficial during sanatorium treatment, when the cases are carefully selected and observed by the resident physician. Nor is there any considerable outspoken objection among physicians to useful work by these patients, under similar conditions. Then why is it that patients so often try to evade useful work in sanatoria? There are many reasons. If the Physician-in-Charge and his assistants are to combat this tendency to evade and shirk by patients, they must know the commoner basic reasons so as to intelligently combat each case according to its merits. There are some people who habitually evaded useful work before they contracted tuberculosis. Naturally the disease has not cured them of their laziness. These people merely need relentless, though moderate, discipline and a stern but kindly attitude by the physician and supervising orderly and nurses. If they are under thirty years of age, six months in the sanatorium, besides benefiting them physically, is likely to improve their attitude towards useful work and enhance their value, to the community. If older, it will harm none and may help a few. Some of this class of patients will cite many absurd as well as genuine reasons for their objection to work. They may say a doctor or nurse has told them they must rest, whether this has been the case or not. Their improvement and gain in weight while taking daily walks is usually a ready answer. They may invent or feign symptoms, even to the length of biting their buccal mucous membranes to have blood streaked sputum. The physician must be on the lookout for such malingering. Others may object to work because of self pity which has been encouraged by the solicitude of family and friends before they come to the sanatorium. This class must be talked to by the resident physician and made to see the advantages to his mind and body that will result from the work. He must be brought to realize that his cure will be more permanent when it is accomplished while doing some regular work. Only by working under the observation of his physician can he learn how much work he can do without harm. Some will simply try to loaf or slouch through the work assigned, accomplishing next to nothing. Such a patient is demoralizing to his associates and should be spurred up. If he can not do the work reasonably fast and properly without developing symptoms, he should be taken off or assigned to lighter work. Finally there will be patients who can not be made to fit into the working scheme by any amount of patience or effort on the part of the staff. They must be discharged. It is usually this class of patient who writes letter of complaint to the authorities, or lay press, when they are discharged. Every community has its share of these pests and, strange to say, they nearly always come with a letter or verbal recommendation of some respectable

philanthropic citizen or agency. There is certainly nothing so demoralizing to anyone who is not sick in bed as absolute idleness or loafing.

To encourage pride in neatness and cleanliness of shacks and dressing rooms, as well as attractiveness of the grounds about them it is well to maintain a system of prizes, to be given weekly to the occupants of the shacks attaining the highest standard in these features. A special dinner, a drive, a day's vacation from work assignment or some other unusual luxury.

Those patients who have been under treatment for some time are in good condition and have been found peculiarly proficient in some essential position should be placed upon a moderate monthly wage. Such compensation should be small at first and increased gradually, with due consideration to the fact that they receive maintenance and medical care. Those patient employees whose disease has become arrested and who are able to do full and efficient work without bodily harm should be made permanent employees. When nurses or physicians enter as patients, they should be given work according to their education and ability. When their disease is arrested, those who are capable and desirable should be encouraged to accept positions on the permanent staff, when vacancies occur. The policy of graded compensation for a number of essential patient employees is not only an encouragement and help for many patients, it is of far reaching benefit to the community. Many of these people would otherwise return to a city and get work injurious to them. In so doing they soon break down and become, again, an object of charity and not productive. Those who have dependents, if they receive a wage at the sanatorium, can help them financially and keep them from charity institutions and squalor. Furthermore, it has been found that those patients and ex-patients make the most devoted employees. They are peculiarly sympathetic to new patients, and make a splendid framework of influence. From such a loyal body of patient employees there emanates that vague but essential something called "an atmosphere," which is prized so highly by experienced sanatorium men.

Fire drills, in which patients are taught and drilled in the use of fire-fighting apparatus, as well as removing the sick from the Infirmary, should be held regularly and at unexpected times.

CHAPTER XII.

FOOD AND DRUGS.

Glance through the exhaustive menu of any popular hotel and in making mental note of the number and variety of culinary efforts to please the composite public palate, one will at once understand the difficulty of preparing a sanatorium diet which will receive the approval of a majority of its patients. By well nigh unlimited expense and effort a hotel may supply a menu which will gain a reputation for good food, but even in such dining halls how common one hears the remark, "Yes, but give me good home cooking." This simply means that every individual's

taste and appetite is a law unto itself, even in health. Now add to this kaleidoscopic compost the unstabilizing influence of disease and one can but wonder at the fair success attained in the best administered tuberculosis sanatoria. The question of food is undoubtedly the cause and bent of the vast majority of harsh criticisms against most sanatoria.

The food proper is not the only factor of importance in pleasing the appetite and thus giving satisfaction to patient and physician. First, if possible, there must exist an appetite before the food is served. The working plan for patients as outlined in the foregoing chapter provides this for a majority of the patients. A ravenous appetite will overlook a multitude of shortcomings in service and delicacy of food. This is probably the rock foundation of the eternal reputation of "mother's pies." Cleanliness and delicacy of service will aid an indifferent appetite, as their absence may stifle a flagging one. It is probably good economy to provide enough high class labor in the dishwashing room (serving room) to justify the use of moderately thin and attractive china. In careless hands the breakage of such china is so great that most larger institutions are forced to use china that is thick and heavy. Both appetite and food have to be of the best to overcome the discouraging influence of the sight and feel of such dishes. The service in dishes and silver or plated ware should be as light, dainty and attractive as is commensurate with reasonable endurance. Certainly no heavy unattractive dishes should be used in the infirmary where the patients are sick and have little or no appetite. The tables or trays should be dressed as attractively as possible. The unsightly dishes and service are an important factor in the unenviable reputation of most city tuberculosis hospitals. The matrons must never forget that eating is the hardest job that most sick or half sick patients have to do in a sanatorium. It is also the most important and must be made as easy as possible, and even attractive, if this can be done. The arrangement, or garnishing of food on general dishes for the tables may overcome, in a measure, the unsightliness of heavy crockery, when economy (through breakage) forces its use.

Congeniality at table is essential to comfort and conduces to more abundant eating. This is usually best accomplished by seating the occupants of each shack together in the dining hall. It is best to have the tables of such sizes that all the occupants of a shack occupy the same table.

For some years, and even now, to a slight extent, there has been a tendency on the part of medical men to forced and frequent feeding of all consumptives. Great gains in weight were often recorded and cited as indication of gratifying general improvement. The digestive tract was ignored in many cases and stuffing between meals carried to the point of gastric and intestinal intolerance. Many cases of severe and prolonged digestive derangement resulted and were followed by loss of weight, with no improvement in the lung condition. Some years ago it was almost universal to have the patient take from four to eight eggs and a quart of milk every day, between meals. They were also urged to eat full meals. Very few could tolerate this and the resultant digestive discomfort with subsequent loss of ground in many led to moderation. A few observers were so imbued with the necessity of over feeding, they advised the

taking of castor oil every night to provide an empty tract for forced gluttony every day. The writer examined one patient whose physician had her taking twelve eggs and three pints of milk every day, besides forcing down as much of three regular meals as her stomach would hold. In this case the stomach did not hold the food more than thirty minutes. Though the patient complained of vomiting always after taking food, it was simply regurgitation, as is seen in overfed infants. No doubt there are some persons, undernourished from tuberculosis, or other cause, who gain weight and are benefited by judicious taking of milk and eggs, milk and toast, zoolak or broth and a sandwich between, and in addition to their regular meals. This is so in those who, from habit or otherwise, cannot take a really generous quantity of food at meal times. This is also more likely to be necessary when the patient cannot be placed under such a close regime as is possible in a sanatorium. Even in the sanatorium there will be exceptional patients, in the infirmary and occasionally one in other shacks, who should have extra food between meals.

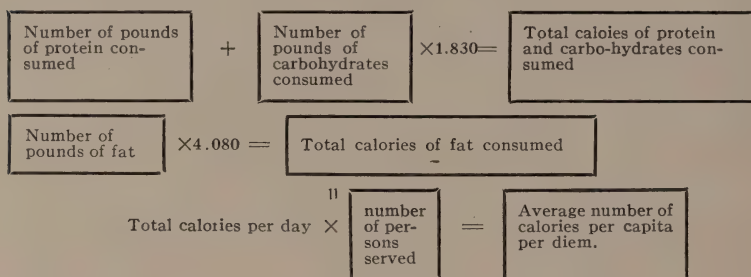
At the Otisville Sanatorium milk and raw eggs were given between meals to all patients previous to 1910. Upon observing that many did not have a good appetite for meals, they were not given the eggs and milk between meals. Immediately their appetites improved and they gained weight faster than they had before. Furthermore, they gained weight as well, on the average, as those who had continued to receive extra feeding. After some months observation, to be sure of making no mistake, eggs and milk between meals was discontinued throughout the sanatorium and our gains in weight and results in lung and general conditions have been just as satisfactory as they were before 1910. There have always been a few patients who received extra nourishment between meals. The one essential is that each patient take as much wholesome food as his digestive apparatus will care for without injury. Variety is about as important as the quality of food. The infirmary nurse must eternally strive to provide variety and quality of food to tempt the appetites of her patients. It will be difficult in some cases, but there is nothing more important. The job of providing food for a large sanatorium is too important for an ordinary cook, no matter how good a cook she may be. A dietitian, with special education in food values should be in charge of this problem. The aims in any dietary are obviously quality, quantity (necessary calories), variety and no waste. Waste may occur in the ice box, in the kitchen, in the serving room, on the table or on the plate.

Although cost of food is constantly changing, so that no year's cost can fairly be compared with the cost of several years before, still this must be kept at the lowest possible figure commensurate with proper food values in calories and patient weights. In 1914 the per capita cost per diem in the Otisville Sanatorium, for food, was 37 cents. During this time the patients were contented and their gains in weight were satisfactory. The per diem cost one year earlier had been 42 cents. It would, of course, be impossible to supply an equally satisfactory diet at the present time, 1918, at as low a figure.

Calories, though of some importance, are by no means all that is

necessary to consider in the arrangement of a diet. Variety, cooking and quality acceptable to the patients is equally essential.

The following is a diagrammatic scheme for computing the caloric content of food:



Pounds are converted into grams by multiplying by 453.5925.

Bardswell and Chapman give the following as a fair standard diet protein 144 grains, fat 160 grains and carbohydrates 270 grains per day. This gives 3,186 calories. For light work 2,300 calories are necessary, for moderate work 2,600, and for heavy work 3,100 calories are necessary in man weighing 140 pounds. An adult at rest needs about 1,800 calories per day and 2,100 when in repose. Children require 36 calories per pound of their body weight per day.

Dr. Rathbun has found that the shrinkage waste in cooking and serving roast beef is 64 to 60 per cent, liver 69, roast chicken 74 and salt pork 46 per cent. Every article of food used should be carefully inspected first before it leaves the storehouse by the storekeeper, and against just before it is cooked or served by the dietitian. A handful of the cereal should be spread on clean white paper and a handful on clean black paper and searched to detect worms or weavels. If any such blemish be detected the cereal should not be used for food. It must be either returned to the dealer or cooked and fed to chickens or pigs. Meat and other foods must also be doubly inspected before they are cooked.

Any defect in food detected by the storekeeper should be at once reported to the Superintendent in writing. If the defect is discovered by the dietitian, it should be reported to the Physician-in-Charge in writing, who reports it to the Superintendent. If possible, a substitute should be gotten at once from the storehouse, to avoid a faulty or deficient meal. These facts should be reported as stated. A wise Physician-in-Charge will taste the food from every patient's kitchen once or twice a week.

The following diet table has given satisfaction at the Otisville Sanatorium. It will be seen that, by following this table, no meal is repeated oftener than once in four weeks. Thus monotony of diet, so objectionable to many people, is avoided. Practically all waste from a sanatorium dining hall should be utilized. The facts, separated, can be made into soap. Enough soap for scrubbing and laundry can be obtained in this way. Soap powder and washing powders may have to be purchased in addition for the laundry. The other food not eaten should be separated from

Menu for Meatless Days—Male Unit.

FIRST WEEK.

Breakfast—Monday—
Cornmeal mush,
bread, butter, milk, coffee.

Dinner—
Soup, roast lamb, gravy, buttered
carrots, steamed potatoes, bread,
etc., rice custard.

Supper—
Roast beef, gravy, steamed pota-
toes, bread, etc., stewed prunes.

Breakfast—Tuesday—
Farina, eggs, rolls, bread, butter,
milk and coffee.

Dinner—
Cream soup, codfish cakes, tomato
sauce, mashed potatoes, pickled
beets, bread, etc., cottage pud-
ding with sauce.

Supper—
Macaroni and cheese, potato salad,
bread, etc., apple sauce.

Breakfast—Wednesday—
Oat flakes, eggs, rolls, bread, but-
ter, milk, coffee.

Dinner—
Soup, roast beef, gravy, mashed
potatoes, mashed turnips, bread,
etc., canned fruit.

Supper—
Cold meat, mustard, fried pota-
toes, pickles, bread, etc., jam.

Breakfast—Thursday—
Wheatena, sausage meat, bread,
butter, milk, coffee.

Dinner—
Soup, corned beef, mustard,
steamed potatoes, fried parsnips,
bread, etc., pie.

Supper—
Lamb and beef stew with vege-
tables, steamed potatoes, bread,
etc., apple sauce.

SECOND WEEK.

Breakfast—Monday—
Wheatena, boiled
eggs, bread,
butter, milk, coffee.

Dinner—
Soup, pot roast, gravy, steamed
potatoes, mashed turnips, bread,
etc., chocolate bread pudding
with sauce.

Supper—
Frankfurters, mustard, fried pota-
toes, cheese, bread, etc., stewed
peaches.

Breakfast—Tuesday—
Hominy, boiled eggs, bread, rolls,
butter, milk, coffee.

Dinner—
Cream soup, macaroni with toma-
toes, boiled potatoes, vegetable
salad, bread, etc., cottage pud-
ding with sauce.

Supper—
Rice cakes, baked potatoes, salad,
bread, etc., stewed prunes.

Breakfast—Wednesday—
Farina, griddle cakes, syrup,
bread, butter, milk, coffee.

Dinner—
Soup, roast lamb, gravy, mashed
potatoes, string beans, bread,
etc., tapioca pudding.

Supper—
Hamburger steak, gravy, pickles,
steamed potatoes, bread, etc.,
apple sauce.

Breakfast—Thursday—
Oat flakes, boiled
eggs, rolls,
bread, butter, milk, coffee.

Dinner—
Soup, roast pork, gravy, mashed
potatoes, boiled onions, bread,
etc., canned fruit.

Supper—
Fried beef liver, gravy, steamed
potatoes, pickles, bread, etc.,
stewed prunes.

THIRD WEEK.

Breakfast—Monday—
Hominy, boiled eggs, bread, but-
ter, milk, coffee.

Dinner—
Soup, roast pork, gravy, mashed
potatoes, boiled onions, bread,
etc., rice pudding.

Supper—
Roast beef, gravy, steamed pota-
toes, bread, etc., stewed prunes.

Breakfast—Tuesday—
Wheatena, boiled
eggs, rolls,
bread, butter, milk, coffee.

Dinner—
Soup (cream), cod fish
cakes,
mashed potatoes, string
beans, bread, butter,
milk,
tapioca pudding.

Supper—
Boiled mackerel, steamed potatoes,
pickles, bread, etc., jam.

Breakfast—Wednesday—
Cornmeal mush, eggs, rolls, bread,
butter, milk, coffee.

Dinner—
Soup, corned beef, mustard,
mashed potatoes, carrots and
peas, bread, butter, etc., pie.

Supper—
Lamb and beef stew, fried pota-
toes, cheese, bread, butter, etc.,
stewed figs.

Breakfast—Thursday—
Oat flakes, corned beef hash, rolls,
bread, butter, milk, coffee.

Dinner—
Soup, roast beef, gravy, mashed
potatoes, fried parsnips, bread,
butter, milk, pie.

Supper—
Beef steak, gravy, steamed pota-
toes, relish, bread, etc., stewed
peaches.

FOURTH WEEK.

Breakfast—Monday—
Farina, boiled eggs, bread, butter,
milk, coffee.

Dinner—
Soup, pigs' heads, mustard,
steamed potatoes, mashed tur-
nips, bread, butter, milk, bread
pudding with sauce.

Supper—
Roast veal, gravy, fried potatoes,
vegetable salad, bread, butter,
milk, stewed figs.

Breakfast—Tuesday—
Cornmeal mush, boiled
eggs,
bread, butter, and coffee.

Dinner—
Cream soup, macaroni and cheese,
boiled potatoes, vegetable salad,
bread, etc., cottage pudding
with sauce.

Supper—
Baked hominy, potato salad,
pickles, bread, etc., apple sauce.

Breakfast—Wednesday—
Oat flakes, beef hash, rolls, bread,
butter, milk, coffee.

Dinner—
Soup, hamburger steak, gravy,
mashed potatoes, fried parsnips,
bread, rice pudding, butter, etc.

Supper—
Frankfurters, mustard, fried po-
tatoes, pickles, bread, butter,
jam.

Breakfast—Thursday—
Wheatena, griddle cakes, syrup,
rolls, butter, milk, coffee.

Dinner—
Soup, braised liver, gravy, mashed
potatoes, mashed turnips, bread,
etc., pie.

Supper—
Roast pork, gravy, catsup, steamed
potatoes, bread, etc., stewed
prunes.

Menu for Meatless Days—Male Unit.—Continued.

FIRST WEEK.

Breakfast—Friday—
Hominy, eggs, boiled, rolls, bread,
butter, milk, coffee.

Dinner—
Soup, baked fish, sauce, mashed
potatoes, Harvard beets, bread,
butter, milk, cake (baker).

Supper—
Mackerel baked, steamed pota-
toes, cheese, bread, butter, etc.,
stewed prunes.

Breakfast—Saturday—
Cornmeal mush, corned beef hash,
rolls, bread, butter, milk, coffee.

Dinner—
Soup, roast pork, gravy, steamed
potatoes, boiled onions, bread,
butter, etc., cornstarch blanc
mange with sauce.

Supper—
Roast beef, gravy, fried potatoes,
bread, etc., stewed figs.

Breakfast—Sunday—
Fresh fruit, oat flakes, bread, but-
ter, milk, coffee.

Dinner—
Soup, roast chicken, gibley gravy,
mashed potatoes, rice with to-
matos, bread, butter, lemon
jelly with sauce.

Supper—
Cold meat (ham), mustard,
cream, potatoes, pickles,
bread, etc., jam.

SECOND WEEK.

Breakfast—Friday—
Cornmeal mush, griddle cakes,
syrup, rolls, butter, milk, and
coffee.

Dinner—
Soup, baked fish, sauce, mashed
potatoes, carrots, and peas,
bread, etc., pie.

Supper—
Codfish cakes, sauce, boiled pota-
toes, pickles, bread, etc., cake.

Breakfast—Saturday—
Farina, sausage meat, rolls,
bread, butter, milk, and coffee.

Dinner—
Soup, roast veal, gravy, mashed
potatoes, buttered parsnips,
bread, etc., suet pudding with
sauce.

Supper—
Lamb and beef stew (with pota-
toes, onions and carrots)
pickles, bread, etc., apple sauce.

Breakfast—Sunday—
Oat flakes, coffee cake, bread, but-
ter, milk, coffee.

Dinner—
Soup, chicken fricassee, mashed
potatoes, boiled onions, bread,
butter, milk, Spanish cream
with sauce.

Supper—
Cold meat, mustard, fried pota-
toes, cheese, bread, etc., canned
fruit.

THIRD WEEK.

Breakfast—Friday—
Farina, boiled eggs, rolls, bread,
butter, milk, and coffee.

Dinner—
Soup, fresh fish, sauce, mashed
potatoes, Harvard beets, bread,
etc., cottage pudding.

Supper—
Omelette, steamed potatoes,
pickles, bread, butter, etc.,
stewed prunes.

Breakfast—Saturday—
Wheatena, sausage meat, rolls,
bread, butter, milk, coffee.

Dinner—
Soup, roast beef, gravy, steamed
potatoes, mashed turnips, bread,
etc., tapioca pudding.

Supper—
Fork, Boston baked beans, boiled
potatoes, catsup, bread, butter,
milk, tea, stewed fruit.

Breakfast—Sunday—
Fresh fruit, oat flakes, bread, but-
ter, milk, coffee.

Dinner—
Soup, roast chicken, gravy,
mashed potatoes, string beans,
bread, etc., fruit, jelly with
sauce.

Supper—
Cold meat, mustard, potato salad,
pickles, bread, jam, etc.

FOURTH WEEK.

Breakfast—Friday—
Hominy, eggs, boiled, rolls, bread,
butter, milk, and coffee.

Dinner—
Soup, fresh fish, sauce, mashed
potatoes, creamed onions, bread,
etc., jelly roll.

Supper—
Baked mackerel, sauce, boiled po-
tatoes, vegetable salad, bread,
etc., apple sauce.

Breakfast—Saturday—
Farina, boiled eggs, rolls, bread,
butter, milk, coffee.

Dinner—
Soup, roast lamb, gravy, steamed
potatoes, mashed turnips, bread,
etc., cornstarch blanc mange
with sauce.

Supper—
Lamb and beef stew with pota-
toes, onions, and carrots, bread,
butter, milk, jam.

Breakfast—Sunday—
Oat flakes, coffee cake, bread, but-
ter, milk, coffee.

Dinner—
Soup, chicken fricassee, mashed
potatoes, boiled rice, with to-
matos, bread, etc., lemon jelly
with sauce.

Supper—
Cold meat, mustard, fried pota-
toes, pickled beets, bread, etc.,
canned fruit.

bones and seeds, then boiled and fed to pigs. Bones make the best of fertilizer for fruit trees and grape vines. There should be no actual waste.

Alcoholic drinks should not be taken by patients at any time. There is nothing more injurious to tuberculous patients than even slight alcoholic excess. The avoidance of this menace is one of the most difficult tasks of a sanatorium staff. Friends of patients often smuggle in the forbidden bottle. When deprived of the spirit patients have been known to walk eight miles over a snow covered mountain, by a difficult trail, for a drink and a pint to bring back with them.

Smoking should be prohibited, except on specific permission by the Resident Physician, and in the open air. During the first hour after meals one light cigar or cigarette does not seem to injure arrested or quiescent cases. This is particularly so when the smoker does not inhale the smoke. Of course patients with cough, laryngitis or any other symptoms of an active lesion should not smoke.

Candy eating is only likely to give trouble among children and, to some extent, women. It should only be permitted in limited quantity and at prescribed hours, so as not to interfere with appetite.

Drugs should only be used in a sanatorium as a last resort, when annoying symptoms cannot be relieved by other means. Annoying cough can usually be controlled by silence, rest and will power. Productive cough is rarely annoying.

Tuberculin Treatment.—The writer has been unable to discover any value in this treatment. On the other hand, unless employed with extreme caution, it may cause irreparable harm.

Cough mixtures are rarely advisable in tuberculosis. All cough should be resisted or restrained by the patient's will power. How completely this can be accomplished is noticeable in any well conducted sanatorium. The writer has often spent several hours among the patients in the Otisville Sanatorium and not heard a single cough. A non-productive cough should always be restrained. A productive cough restrained makes it possible to raise sputum with very slight effort, hardly more than clearing the throat. When cough cannot be thus controlled and is exhausting or prevents sleep, $\frac{1}{4}$ to $\frac{1}{2}$ grain of codeine or $\frac{1}{15}$ grain of hereoine must be given. The pain of pleurisy must be similarly relieved, when strapping will not relieve it. A hypodermic injection of morphine, besides absolute rest, is necessary to control free hemorrhage. Of course, constipation, not corrected by habit and diet, must be relieved by medicine or enema, or the judicious blending of all these methods. Other symptoms arising should be treated rationally, but with the use of the smallest possible amount of medicine.

The pain of pleurisy can usually be relieved by proper strapping of the affected side with adhesive plaster.

CHAPTER XIII.

SCHOOL AND RECREATION.

In those sanatoria that receive patients under the age of fourteen years it is clear that some provision must be made for continuing their regular

schooling. Otherwise a vast majority of the children would either suffer mental neglect or be forced to leave the sanatorium before their physical condition warranted it. It is, of course, improper to have the little patients attend a district school in the neighborhood, and this should not be thought of. The only practical solution is to maintain a school in the children's unit and one in the men's unit for boys above the age of eight or nine (too old to be cared for in the children's unit). Every large community has a few school teachers, men and women, who need sanatorium care. From these tuberculous teachers it is always possible to find enough, whose lung and general conditions warrant, to do the teaching in the sanatorium. These teachers naturally benefit by the sanatorium treatment. For the welfare of both pupils and teachers the hours of school should be rather shorter than in general schools. Naturally the two or three hottest months of summer should be devoted to usual summer vacation.

Part of a shack in the children's unit and in a boys' shack of the men's unit should be constructed for school purposes. This school room should be so built that it is flooded with open air in all weather that permits. Even in the coldest weather and during storms the room must have some open ventilation. It is better to keep the children and teachers warm by hot bricks and furs than by general artificial heat and closed windows.

Besides continuing the child's necessary education, while in the sanatorium, school fills many hours with wholesome discipline which would otherwise be demoralizing to the children. They have enough hours for play before and after school. Special school exercises, declamation, songs, instrumental music and the like should be held and attended by patients and staff at stated intervals.

There are many forms of recreation both appropriate and essential to the proper conduct of sanatoria. They may be divided into indoor and outdoor recreations. These may be subdivided into permanent and occasional. The indoor permanent recreations are such as billiards, pool table games, reading and the like. The recreation pavilion in each unit (male and female) should be provided with means for such recreation. Card playing should be prohibited in any place except in the recreation pavilion, where an orderly is in charge. Gambling or playing cards for even small sums of money must be prohibited. Indoor occasional recreations consist of moving picture shows, plays and the like. In a sanatorium of considerable size patient talent can provide such entertainment, at least once or twice a month, under the encouragement and guidance of the supervising nurse and supervising orderly. They provide the only occasions, besides one or two picnics a year, when the two sexes should be allowed to intermingle. The supervising nurse and supervising orderly, aided by advice of staff, should see that such entertainments are given at least twice a month in winter. Dances should be very closely supervised, a physician being present throughout every one. The nurses and supervising orderly should also be present. None of these evening entertainments should last more than two hours.

Outdoor permanent recreations vary somewhat upon the season. In summer they are naturally more varied. Strolling about within set limits,

when not otherwise assigned, is permitted. Such games as croquet, miniature golf, and baseball are among the most common appropriate summer outdoor games for patients. Lawn tennis should be prohibited. It is too



PATIENTS' TULIP BED, A SHACK AND EXTERIOR OF RECREATION PAVILION, OTISVILLE.



INTERIOR OF RECREATION PAVILION, OTISVILLE.

strenuous. Swings should be provided for children, and they should play other moderate children's lawn games. In winter tobogganning, on hills not too steep or long, is a favorite recreation in cold climates.

Occasional outdoor recreation, such as picnics and drives, as well as baseball matches, games to which the patients of all units are invited, should be arranged. Picnics on special national holidays in summer are very enjoyable. Special games and mild tournaments may be arranged for such occasions. A cold attractive lunch in the open shade, when fried chicken, hard boiled eggs and pickles, with bits of twig and last year's leaf, roll pell-mell over the bumpy surface of a snowy cloth spread upon the recalcitrant tufts of summer grass, brings a thrill of joy to children and young adults alike. Our patients should be given these rare occasions to forget their long grim combat with the tubercle bacillus. The baseball diamond and bleachers can be built and kept in order by patient labor. The expenses of most, if not all, of the amusements can be provided by the profit from the patients' store. A store for novelties, candies, cigars, cigarettes, newspapers and stationery should be maintained in the men's unit of every sanatorium of considerable size. It provides an outlet, within the sanatorium, for the universal desire to "go to the store." Only a very small profit should be charged on sales. The patients' store and post office can be conducted together by a patient of long residence. One of the medical staff should, however, be in charge and keep custody of the funds.

In a sanatorium of considerable size a monthly magazine should be written, published and distributed by patients, under the supervision of the resident Physician-in-Charge. All proof should be approved by the Physician-in-Charge, or a member of the staff deputed by him, before publication. The circulation of this publication among ex-patients, which is desirable, would be facilitated by excluding from its title or cover any reference to tuberculosis or consumption. Nothing but a humorous and cheerful reference to the disease, besides formal notices, should be permitted even in the text. The printing press and bindery provided by the administration for the patients, could be used by the patients in the printing of all cards and forms used in the Sanatorium.

Thanksgiving Day (in the United States) and other national holidays should be properly observed and celebrated.

Christmas should be celebrated appropriately. At Otisville there has always been a great illuminated tree, with filled stockings and presents for every patient. On these occasions one of the staff, in cap and beard, has officiated as Santa Claus.

CHAPTER XIV.

PHYSICAL, X-RAY, NOSE AND THROAT, DENTAL AND SPUTUM EXAMINATIONS.

As soon as it is possible and expedient after the patient's admission, the above named examinations should be made and recorded. They should all be completed in not more than one week from the date of admission. The initial general physical examinations should be made by the Resident Physician-in-Charge, Resident Physician of the Male Unit, and Resident Physician of the Female Unit, divided among these three men according

to their available time. Subsequent physical examinations, which should be made upon every patient and recorded once a month, may be done, in part, by other members of the resident medical staff. Cards, such as shown in Chapter XVII, should be used for recording the results of these medical examinations. The records should be made, in ink, at the time of the examination. After this examination is completed, the x-ray examination should be made. The member of the staff who is in charge of the x-ray laboratory should not examine the patient otherwise, nor see the record of physical examination before he takes the x-ray picture, reads or interprets the plate, and records his findings, in ink, on a special card for this purpose. After this is done, he may examine any that elicit his interest. Then the patient's nose and throat should be examined and the laryngologist's finds recorded. After this the resident dentist should make and record his examination and his recommendation for work needed. The dentist should only begin work of repair after his recommendation is approved by the Physician-in-Charge, or Resident Physician of the patient's unit. Sputum should be collected and sent to the laboratory for examination. The cards recording the findings of these various examinations should be assembled and filed in the office of the Resident Physician-in-Charge. Cases found to give doubtful, very unusual or negative physical signs (except in children where the signs are often negative) should be referred to the Physician-in-Charge, for final decision, before the findings are recorded. The records of all unusual findings, or where findings of two examiners vary widely, including x-ray plates, of all cases examined since the preceding clinical conference, should be on hand for examination and discussion at the next conference.

As stated, all patients should be physically examined once a month throughout their sanatorium residence. But those who develop symptoms indicative of change, activity or complication must be examined oftener. Of course, many patients in the infirmary will be examined every day, or as frequently as the Physician-in-Charge deems necessary or advisable. All physical changes noted should be recorded at the time they are detected. X-ray examination, besides being made of every patient within the first week after admission, should be made of every patient within not more than one week before they are discharged, just as physical examinations should be made. For purposes of comparison and for the proper education of the staff a series of not less than twenty x-ray plates of normal chests (persons never suspected of having had tuberculosis) should be on file in the x-ray laboratory. Two of these should be exposed at every clinical conference.

The member of the staff who attends to the work upon nose and throat in the sanatorium should never lose sight of the patient's primary disease, tuberculosis. Certainly any operative or other radical treatment must only be undertaken after full consideration of its possible direct or remote effects upon the tuberculous lesion and after approval by the Physician-in-Charge. No radical operation, except for the release of confined pus, should be performed until approval of the visiting physician is obtained. Approval of the patient, in adults, and of parent or guardian, in minors, is necessary before any operation is performed.

It is the writer's opinion that except for the relief of severe pain or great difficulty in swallowing, no operation should be performed upon the nose or throat of any patients whose sputum contains tubercle bacilli. Palliative treatment is far the best mode of procedure in nasal obstructions or enlarged tonsils in patients with active pulmonary tuberculosis. Even in quiescent or arrested cases, only extreme interference with breathing not relieved by patient and prolonged treatment justifies surgical interference. Far too much radical surgery is done upon the nose and throat in tuberculous persons by most nose and throat specialists, who are prone to view the whole world through the nostril. Physical interference with the sinuses which communicate with the nose has probably caused more harm than benefit in tuberculous people. Time and general improvement, with or without the aid of mild treatment of the nose and throat, will usually bring relief to most of these patients, who complain of some nasal obstruction, even though they may have a deflected septum or enlarged turbinated bones. Even enlarged tonsils and adenoids are often improved by time and cleanliness.

CHAPTER XV.

ROUNDS, ABSENCES AND DURATION OF STAY.

In the interest of discipline and to see that the entire conduct of the sanatorium is properly maintained, the Resident Physician-in-Charge should make complete rounds in each unit every day. These rounds should be at set hours. The Physician-in-Charge should be accompanied by the Resident Physician of the unit and other physicians of the unit, the supervising nurse and supervising orderly. He should visit every building room or ward wherein the patients sleep. At this time every patient's locker should be open for inspection. All patients should stand beside their beds during the inspection, except the bed patients. The Resident Physician should call the attention of the Physician-in-Charge to any development of interest concerning the patients. The supervising nurse and supervising orderly should make their reports to the Resident Physician of the unit. The nurse in charge of the infirmary wards will, of course, accompany the Physician-in-Charge during his rounds in this building. Any members of the medical staff, not otherwise assigned, should accompany the Physician-in-Charge on rounds. The grounds about the shacks should be inspected at this time.

The visiting (or attending) physician should be accompanied by the Physician-in-Charge, Resident Physician of the unit, supervising nurse, supervising orderly and any members of the medical staff not otherwise assigned. The value of the punctilious observance of these formalities is difficult to estimate, but an institution that wishes to maintain high standards must keep them up. Good results and discipline are inseparable. They can not long exist singly in a large institution.

Leaves of Absence should be generally discouraged in a tuberculosis sanatorium and they should only be granted to patients for short periods

of time and only for exceptional reasons. Only for extraordinary purposes should a patient be permitted to leave the sanatorium, even for one day, during his first month of stay. It is a good policy to impress upon every prospective patient that he will not be permitted to leave the sanatorium on temporary leave, in less than three months after his admission. There are few things more likely to upset the good influence of the sanatorium regime more than leaves of absence, especially in a patient's early months. Leaves of absence must always be looked upon by the patients as a privilege granted only to those who have proven their good behavior, self-control and for exceptional reason.

If the patient's welfare were the guiding factor, as is the case in all other matters in the sanatorium, all leaves of absence would be granted on occasions that would hold out the least probably injury. But, in fact, absences are sought for on occasions when the opposite is nearly always the case. Usually times of holiday and feasting, or when the home is saddened by death and patient is most upset by intimate contact with it, are the occasions when leaves of absence are most in demand. Probably the most difficult of control are the unreasoning requests for leaves of absence asked for by Jews during the Jewish religious holidays. It is strange that any intelligent being should turn so beneficent a motive as religion to such a malign influence. The feasting and minor dissipations involved in these celebrations last for many days and, although a patient may have been most faithful in learning and practicing the regime necessary for control of their disease, a Jew will often insist upon a leave of absence in which to celebrate their religious holiday, with every reason to expect that it will undo the health they have regained by months of sanatorium treatment.

The writer has seen no few of these Jews return to the sanatorium with loss of weight and return of active symptoms after such leaves of absence. Except in the cases of old patients whose disease is well arrested, it is probably best to refuse leaves of absence for religious holidays, including Christmas and Easter. Those who insist upon going after leave is refused and the refusal explained should be discharged. Every leave of absence should be granted for a definite number of days, and if the patient has not returned, or obtained an extension for valid excuse, they should be discharged. This condition should be clearly understood by every patient who obtains a leave of absence.

Relaxation of proper rules of life, of diet, rest and hours of sleep are the chief ways that absences do harm. Drinking of alcoholic beverages and other dissipations during a leave of absence has been the exciting cause of active advance and fatal termination in many sanatorium patients, who by months of patient discipline and self-control had about come in sight of arrest of their disease.

Duration of Stay in the sanatorium must, of course, depend upon the rapidity or slowness of healing and repair in lesion and body. No patient should be admitted who does not agree to remain at least three months. A shorter time is wasted in any clinical case of tuberculosis. On the other hand many must remain under treatment six months to two

years to obtain a fairly reliable arrest of their disease and recovery of bodily strength and vigor. The decision should remain with the Resident Physician and Physician-in-Charge. There will always arise some conscientious patients who, having dependents, will not stay long enough. They return to work knowing the risk they take. No medical rules can dominate this human element entirely and no sanatorium physician should judge these people harshly. They must not be confused with the careless or impatient people who merely have not the courage to remain longer away from their habitual environments. Those who leave through home obligations should be told to return as soon as signs of danger reappear. It is a question whether it is worth while to readmit the other class.

Those patients who have remained in the infirmary, in bed with temperature, and showing no improvement after three months or more of proper care should, unless there is special reason for retaining them, be discharged to make room for another patient who may be improved. When there is no waiting list such patients can be given a longer trial before they are discharged or transferred to a hospital. There is also a time beyond which patients whose disease is arrested, and who are not performing essential work in the sanatorium with peculiar ability, should not be retained. To encourage prolonged semi-idleness by men or women after their disease is arrested is very demoralizing to them. It is also an injustice to other prospective patients and an unwarranted expense to the community. The sanatorium should care for as many patients as possible, and this can only be done if they are discharged as fast as their conditions permit. The Physician-in-Charge, as well as the Attending Physician must constantly consider this phase of the institution.

CHAPTER XVI.

AFTER THE SANATORIUM.

Follow-up Work.

If every patient discharged from the sanatorium with arrested disease and restored bodily health could thereafter pursue a well-regulated life in the open air, with occupation suited to his abilities, there would be little or no reason to give them further thought. The education and experience they acquire in the sanatorium would, no doubt, be enough to enable the vast majority to retain their health. But, unfortunately, such is far from the existing condition. In the first place, the disease is one which affects chiefly those who through habit and necessity live under the most congested and unhygienic conditions. Those few who may have means before they are stricken only too often exhaust them before entering a sanatorium, so they cannot choose, but return to their former habitation and work when restored to bodily vigor. The majority have always been poor in this world's goods and could never choose their work or abode. They are usually capable of only one kind of work, nearly always an indoor occupation which was the predisposing cause of their disease and will be the exciting cause of its reactivation after

discharge from the sanatorium. Furthermore, even if we could offer rural work and life to these city people when they leave the sanatorium the vast majority would refuse. Their family, friends, responsibilities and their life's desires are too closely interwoven with the congested districts.*

For reasons stated, and many other, mostly economic, much of the good work done in sanatoria is undone after the patients leave the institution. It is very easy for the physician to say to every patient when they are discharged, "Now you are cured, but unless you live right, eat right, rest right and get plenty of air and you will have a relapse. If you apply the knowledge you have gained here to your life at home, you will stay well." It is true in many cases and easy to say, but, how is the patient with an empty pocket and an earning capacity of \$12 a week, providing they work eight hours a day in bad air, to follow this advice? No one has ever answered this question and it is not likely that it will ever be answered entirely. If it were, the tuberculosis problem would soon cease to exist. Much is being done to meet this need within cities. A great deal has been accomplished by many agencies approaching the problem from various points of view, but the sanatoria have thus far remained too detached from the after life and struggles of its patients once they are discharged. It is here that the greatest confidence and influence is generated. These forces should continue to work actively for the help and guidance of the patients after they return to their life's burdens. The Sanatorium Social and Record Service, hereafter outlined, was suggested by the writer in 1914:

Sanatorium Social and Record Service.

Landis, expressing a well-recognized fault in our present efforts to control tuberculosis, said that we only remove "the patient temporarily from unsanitary surroundings, for the purpose treatment, and then allow him to return to his unsanitary living conditions." It is true that considerable effort and money have been expended in the construction of model tenements. But, even if it was possible to construct enough model tenements to accommodate all the families that have one or more tuberculous members, could we induce these people to accept the label that residence in these houses would attach to them?

Probably not. Furthermore, would these model tenements contain model homes from a sanitary point of view, when occupied by people who have not been taught and learned order, cleanliness, the value and preparation of food and a love of fresh air? It has been found that they do not. The report of the Edinburgh School Union, after eighteen years of study, states that the problem "lies in the people, not in the houses." Undoubtedly the best results will come from a combination of the best housing obtainable and encouraging instruction in home hygiene. For obvious reasons the giving of material aid should be

NOTE.—* Some valuable work and observations have been accomplished in efforts at the establishment of farm colonies for these people by Sir Robert W. Philip, chiefly in Edinborough, Scotland, but this opens a chapter in the anti-tuberculosis work with which this book does not deal.

closely and intelligently confined to cases of absolute necessity. Instruction should continue until it is found that the family has permanently acquired a good standard of home hygiene, whether this requires two or twenty visits by a social service nurse. Some efforts have been made to follow up, control, help and instruct that class of the tuberculous discharged from sanatoria, but with very unsatisfactory results. It has been found that these ex-patients carefully evaded all attempts which have been made to keep in touch with them. The failure of all efforts thus far expended, by correspondence, through clinics, social service workers and health authorities has been due, no doubt, to a not unnatural resentment of surveillance by authorities and persons with whom they are only barely, or not at all acquainted. The sanatorium itself, through social service nurses, who work in the sanatorium and establish there an intimate personal acquaintance with the patients, will be the successful agent in this field. In the sanatorium the patients acquire a close and trusting confidence in the doctors and nurses, to a degree not known in city hospitals, clinics, or day camps. The reasons for this are quite obvious and do not reflect in any way against the sincerity of those conducting the city institutions.

The Sanatorium Social and Record Service should have its home in and be part of the sanatorium. It would not be enough that it be called the Sanatorium Social and Record Service. If it is in the city or town where the patient resides after discharge from the sanatorium, he or she will feel the odium of surveillance, which has been the stumbling block to all former efforts. The following is a tentative outline for such service:

1. Name: Sanatorium Social and Record Service.
2. Headquarters: In the sanatorium, under the immediate direction of the physician in charge.
3. Branch Office: In the city (one room).
4. Employees: 1 head social service nurse, 2 to 4 assistant nurses, 1 office clerk at sanatorium, 1 office clerk in the city.
5. Correspondence: With discharged patients to be conducted entirely at the sanatorium.
6. Records: To be kept in the sanatorium. Required data to be furnished to the city representatives and authorities.
7. All nurses, except the head nurse, to spend, alternately, one week at the sanatorium and two to three weeks in the city doing social service work and collecting records of discharged patients. Head nurse to spend most of her time in the sanatorium, the remainder at work in the city, as directed by the physician-in-charge.
8. A weekly paper to be composed and printed in the sanatorium by the patients, to be edited and supervised by the physician-in-charge, and to be mailed to discharged patients, the cover of this paper to contain no reference to tuberculosis or to the sanatorium.

CHAPTER XVII.

Name	DATE	TRAIN
Discharge		
Transfer (Stretcher)		
PASS to		

No. _____

For the week beginning _____

You are ordered to see Dr. _____ by Ten A.M. each day.

Work assigned

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A. 10.	A. 10.	A. 10.	A. 10.	A. 10.	A. 10.	A. 10.

[illegible]

DEPARTMENT OF HEALTH
THE CITY OF NEW YORK

FEMALE UNIT

Flannel Sheets.....
Sheets.....
Pillow Slips.....
Spreads.....
Pajama Coats.....
Pajama Pants.....
Night Gowns or Shirts.....
Towels, Hand.....
Towels, Bath.....
Combinations.....
Socks-Stockings.....
Undershirts.....
Drawers.....
Petticoats.....
Skirts.....
Waists.....
Name.....
Number.....
28 O-1915 22,365, '16, 15,000 (T)

47 O-1915

Municipal
Sanatorium

35-2545-17-3, Form 150

DEPARTMENT OF HEALTH
THE CITY OF NEW YORK

Flannel Sheets.....
Sheets.....
Pillow Slips.....
Spreads.....
Pajama Coats.....
Pajama Pants.....
Night Caps.....
Towels, Hand.....
Towels, Bath.....
Outside Shirts.....
Socks.....
Under Shirts.....
Under Drawers.....
Name.....
Number.....

22-221, '15, 600 (P)

Female Unit

CLOTHING LIST

NAME OF ARTICLE	NO	NAME OF ARTICLE	NO.
SWEATER		UNDER DRAWERS, LIGHT	
COAT		UNDER DRAWERS, HEAVY	
CAP		UNDER SHIRTS, LIGHT	
HAT		UNDER SHIRTS, HEAVY	
GLOVES		CORSET COVERS, LIGHT	
WAISTS, LIGHT		CORSET COVERS, HEAVY	
WAISTS, HEAVY		BED SOCKS	
SKIRTS, LIGHT		BATH ROBE	
SKIRTS, HEAVY		STOCKINGS	
DRESSES, LIGHT		SHOES	
DRESSES, HEAVY		RUBBERS	
PETTICOATS, LIGHT		ARCTICS	
PETTICOATS, HEAVY		SUIT CASE	

Name.....
Number.....
Date Admitted.....

Municipal Sanatorium**MALE UNIT****CLOTHING LIST**

NAME OF ARTICLE	No.	NAME OF ARTICLE	No.
Overcoat		Sweater	
Cap		Pajamas	
Hat		Bathrobe	
Suit Clothes		Shoes	
Top Shirts, Light		Socks	
Top Shirts, Heavy		Rubbers	
Under Shirts, Light		Arctics	
Under Shirts, Heavy		Slippers	
Overalls		Gloves	
Under Drawers, Light		Shaving Outfit	
Under Drawers, Heavy		Suit Case	
Trousers			

Name _____

Number _____

Date Admitted _____

DEPARTMENT OF HEALTH

CITY OF NEW YORK

OTISVILLE SANATORIUM

APPLICATION FOR DISCHARGE

Date.....191

I hereby apply to be discharged on (date)..... for
the reason that.....

My address will be..... and the
name and address of my nearest relative (or friend)

Name.....

Address.....

(Signed).....

NOTE.—Application for discharge must be made five days in advance.

DEPARTMENT OF HEALTH

OTISVILLE SANATORIUM

APPLICATION FOR DISCHARGE

Name.....

TUBERCULOSIS INSTITUTION REPORT

Date	191	Institution	NAME	AGE	ADDRESS	OCCUPATION	Admitted	Discharged	Chief

DEPARTMENT OF HEALTH
MUNICIPAL SANATORIUM

WEIGHT SUMMARY ENDING 191

TOTAL PATIENTS	IN BED	ON PASS	NEW	NUMBER WEIGHED	NUMBER GAINED	PERCENTAGE	AVERAGE GAIN	GREATEST GAIN	OF THESE NUMBER LOSING	PERCENTAGE	AVERAGE LOSS	GREATEST LOSS	NUMBER STATIONARY	PERCENTAGE
-------------------	-----------	------------	-----	-------------------	------------------	------------	-----------------	------------------	------------------------------	------------	-----------------	------------------	----------------------	------------

P-2538-17-3

MALE-ADULTS

MALE-CHILDREN 14 YEARS AND UNDER

FEMALE-ADULTS

FEMALE-CHILDREN 14 YEARS AND UNDER

NAME	AGE	ADDRESS	OCCUPATION	Admitted	Discharged	Died
------	-----	---------	------------	----------	------------	------

CENSUS					VACANCIES				
ADULTS		CHILDREN		TOTAL	ADULTS		CHILDREN		TOTAL
MALE	FEMALE	MALE	FEMALE		MALE	FEMALE	MALE	FEMALE	

DISCHARGE REPORT

Report of (Hosp.) (San.) (Prev.)

Name Age

Address

Discharged on

ADMISSION	Date
	Lesion
	Height
	Weight
	Sputum

DISCHARGE	Lesion
	Weight
	Sputum
	Condition
	Reason for Discharge
	Conduct
	Change of Address
	Remarks

Date Supt.

Record No. _____ Date of Admission _____ On Discharge Notify { }
 Name _____ Patient's No. _____ Birthplace _____
 Address _____ Sex { MALE / FEMALE } Age _____ Marital State { SINGLE / MARRIED / WIDOWED / SEPARATED } Color { WHITE / BLACK } A Citizen { YES / NO } Religion { R. C. / PROT. / M. / J. / ATH. } How long in N. Y. City? _____
 Name and Address of Church Attended _____ Birthplace _____ Address _____
 Father's Name _____ Mother's Maiden Name _____
 Last Occupation _____ Occupation when first taken Sick? _____ Worked until? _____
 Names of Nearest Relatives or Friends _____
 FAMILY HISTORY _____ Outfit Furnished by _____
 Family Assisted by _____

Father Father's Brothers or Sisters Brothers Husband Children Grand Father	LIVING OR DEAD	AGE	IF LIVING, PRESENT HEALTH	IF NOT LIVING, AGE AT DEATH, CAUSE OF DEATH	Mother Mother's Brothers or Sisters Wife Grand Mother	LIVING OR DEAD	AGE	IF LIVING, PRESENT HEALTH	IF NOT LIVING, AGE AT DEATH, CAUSE OF DEATH	IF LIVING, PRESENT HEALTH	IF NOT LIVING, AGE AT DEATH, CAUSE OF DEATH

Remarks (State sequence of infections in family)
 PREVIOUS HISTORY _____
 Habits _____ Late Hours _____
 Name of Private Physician _____
 Breast or Bottle Fed? _____
 Rheumatism—Frequent Colds—Pneumonia—Pleurisy—Influenza—Venereal Disease—Epilepsy—Diseases of Bones, Joints or Glands—Nephritis—Fistula in Ano
 Appendicitis—Any other Diseases or Operations? _____
 HISTORY OF PRESENT DISEASE _____

Mode of Onset _____ First Noticed _____
 Do you feel able to Work? _____
 Has your Sputum Changed in Character? _____
 Hemoptysis { WHEN? / AMOUNT? } _____
 Endurance _____
 Night Sweats _____
 Chilly Sensations _____
 Appetite _____
 Most Pronounced Present Symptoms _____
 Cough { NONE / SLIGHT / MODERATE / SEVERE / TIME } _____
 Loss of Flesh _____
 Malaise _____
 Menstruation _____
 Digestion _____
 First Symptoms Noticed { COPIOUS / MODERATE / SCANTY / NONE / TIME } _____
 Sputum _____
 Pain { LOCATION / CHARACTER } _____
 Nervousness _____
 Character { MUCO PURULENT / MUCCOID / SALIVARY } _____
 When? _____ First Diagnosed _____
 Temp. _____
 Odema _____
 Dyspnoea { ON SLIGHT EXERTION / AT REST } _____
 Bowels _____

Name _____

Record No. _____

Detailed History of Present Illness

QUESTIONS FOR WOMEN

Menstruation Began _____

Regular—Irregular _____

Amount of Flow _____

Painful? _____

Number of Childbirths and Dates _____

Difficult Labors _____

Miscarriages _____

Babies Nursed _____

Pelvic Disorders _____

PHYSICAL EXAMINATION

General Appearance _____

Type of Chest _____

Expansion { Perfect
 Imperfect

Glands _____

Nervous System _____

Rectum _____

Blood Pressure _____

Heart Apex _____

Other Organs _____

Tuberculous Complications _____

Non-Tuberculous Complications _____

Build { Robust
 Medium
 Slender

Clavicles _____

Retractions _____

Fingers _____

Mental Condition _____

Abdomen _____

Diastolic _____

Impulse _____

Complexion { Blonde
 Medium
 Brunette

Scapulae _____

Apical Muscles { Tense
 Normal

Costal Angle _____

G. U. _____

Uterus and Appendages _____

Pulsations _____

Thrill _____

Shoulders _____

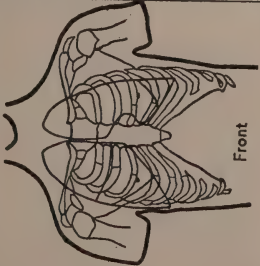
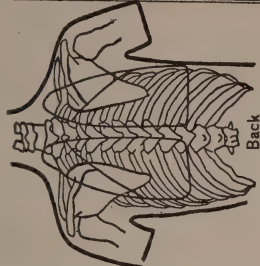
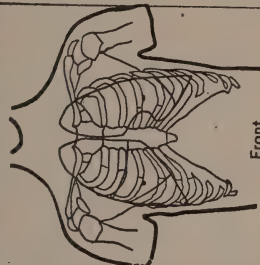
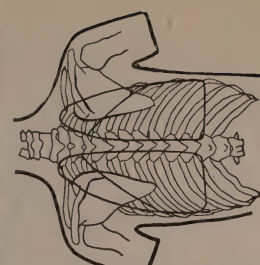
Tender Points _____

Skin _____

Arteries _____

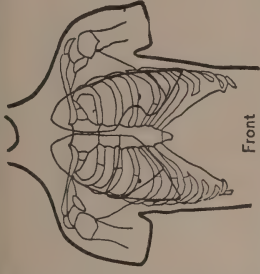
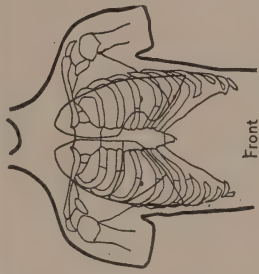
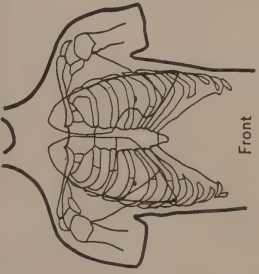
Murmurs _____

(BACK)

Name	Record No.	19	Chest Examination on Admission (Date)	19	Chest Examination on Discharge (Date)	19	
 Front		 Back		 Front		 Back	
PERCUSSION NOTE III Slight Impairment //// Moderate ##### Duress VOICE CONDUCTION D.V. Diminished I.V. Increased Cavitation Cavitation? RALES + Sonorous x Sibilant o Large Moist . Subcrepitant . Crepitant ~ Friction Fluid		Remarks		Resident Physician's Opinion of Patient's Condition		Examiner	
Breath Sounds—Right Lung		Breath Sounds—Left Lung		COVERING ENTIRE PERIOD OF TREATMENT Cough { Improved Unimproved Expectoration { Less Increased Changed in Color Changed in Character Hemoptysis Pain { Location Character Strength { Improved Unimproved Malaise Night Sweats Dyspnoea { Improved Unimproved Appetite { Good Fair Poor General Condition { Improved Unimproved Weight { Gain (Amt.) Loss (Amt.) Temperature Range Do You Feel Able to Return to Your Work?		Date of Admission Date of Discharge Department Reason for Discharge Condition on Discharge 122-142, '16, 1,000 (P)	
Probable Duration of Present Illness (Judging from Examination) Description of Lesion		Examiner					
Stage 34 O-1916							

(FRONT)

<p>Name _____</p> <p>Remarks _____</p>	 <p>Front</p> <p>Back</p>	<p>Date _____</p> <p>Examiner _____</p> <p>Remarks _____</p>	<p>MONTHLY SUMMARY</p> <p>Cough { None Slight Moderate Severe }</p> <p>Expectoration { Lessened None Increased Changed in Character }</p> <p>Hemoptysis { When Amount Location Character }</p> <p>Pain { Location Character }</p> <p>Appetite _____</p> <p>Weight _____</p> <p>Malaise _____</p> <p>Occupation During Month _____</p> <p>Acute Illness _____</p> <p>Strength _____</p> <p>Temperature Range _____</p>
<p>Date _____</p> <p>Examiner _____</p> <p>Remarks _____</p>	 <p>Front</p> <p>Back</p>	<p>Date _____</p> <p>Examiner _____</p> <p>Remarks _____</p>	<p>MONTHLY SUMMARY</p> <p>Cough { None Slight Moderate Severe }</p> <p>Expectoration { Lessened None Increased Changed in Character }</p> <p>Hemoptysis { When Amount Location Character }</p> <p>Pain { Location Character }</p> <p>Appetite _____</p> <p>Weight _____</p> <p>Malaise _____</p> <p>Occupation During Month _____</p> <p>Acute Illness _____</p> <p>Strength _____</p> <p>Temperature Range _____</p>
<p>Date _____</p> <p>Examiner _____</p> <p>Remarks _____</p>	 <p>Front</p> <p>Back</p>	<p>Date _____</p> <p>Examiner _____</p> <p>Remarks _____</p>	<p>MONTHLY SUMMARY</p> <p>Cough { None Slight Moderate Severe }</p> <p>Expectoration { Lessened None Increased Changed in Character }</p> <p>Hemoptysis { When Amount Location Character }</p> <p>Pain { Location Character }</p> <p>Appetite _____</p> <p>Weight _____</p> <p>Malaise _____</p> <p>Occupation During Month _____</p> <p>Acute Illness _____</p> <p>Strength _____</p> <p>Temperature Range _____</p>

Remarks 	 <div style="display: flex; justify-content: space-around;"> Front Back </div>	MONTHLY SUMMARY Cough { None, Slight, Moderate, Severe } Expectoration { Lessened, None, Increased } Hemoptysis { When Changed in Character, Amount } Pain { Location, Character } Appetite Weight Malaise Occupation During Month Acute Illness Strength Temperature Range
Date Remarks 	 <div style="display: flex; justify-content: space-around;"> Front Back </div>	MONTHLY SUMMARY Cough { None, Slight, Moderate, Severe } Expectoration { Lessened, None, Increased } Hemoptysis { When Changed in Character, Amount } Pain { Location, Character } Appetite Weight Malaise Occupation During Month Acute Illness Strength Temperature Range
Date Remarks 	 <div style="display: flex; justify-content: space-around;"> Front Back </div>	MONTHLY SUMMARY Cough { None, Slight, Moderate, Severe } Expectoration { Lessened, None, Increased } Hemoptysis { When Changed in Character, Amount } Pain { Location, Character } Appetite Weight Malaise Occupation During Month Acute Illness Strength Temperature Range

(FRONT AND BACK SIMILAR)

Patient's No.

(4)

TEMPERATURE CARD

Name

Entered Infirmary

Reason

Record No.

Admitted

Date

Time

PULSE TEMP.

140

108

130

107

120

106

110

105

100

104

90

103

80

102

70

101

60

100

99

98

97

96

95

94

Respiration
Defecation
Urination
Remarks

Record No.

DATE

POUNDS

The normal average weight to be entered in RED ink.
The standard weight to be entered in GREEN ink.

Name

Average Weight
Height

Highest

Lowest (Recent)

(FRONT AND BACK SIMILAR)

LABORATORY CARD

SPIRITUM EXAMINATION (Enter Positive in Red Ink—Negative in Black Ink)

Name _____

[illegible]

SPECIAL LABORATORY EXAMINATIONS (Blood—Feces—Wassermann Reaction, Etc.)
(FRONT)

(6)
LABORATORY CARD

Name

Date

Amount in 24 Hours

Color

Transparency

Reaction

Sp. Gr.

Albumin

Urea

Sugar

127

Date

Amount in 24 Hours

Color

Transparency

Reaction

Sp. Gr.

Albumin

Urea

Sugar

SPECIAL EXAMINATIONS

Name

TREATMENTS AND COMPLICATIONS

TUBERCULOSIS SANATORIUM--OTISVILLE, N. Y.
Record No.

(FRONT)

RECORD OF TREATMENT

Name

Form No. 410, 3-67-14 (L. B.) 3000

(BACK)

THROAT, NOSE, EAR AND EYE

Name

HISTORY: Throat and Nose—Odynophagia

Rawness

Voice: Dysphonia

Respiration: Dyspnoea

Other Symptoms: Dysphagia, etc.

Previous History, Treatment, etc.

Ear Symptoms: Deafness

EXAMINATION

Left Nasal Chamber

Right Nasal Chamber

Septum

Oro-Pharynx

Naso-Pharynx

Lingual Tonsil

Larynx and Trachea

Inter-Aryt.

Vocal Cords R:

Ear R.

Eyes R.

DIAGNOSIS, Tentative

Date

19

Examiner

Sensitive to touch

Dripping

Modified

Obstructed

Odynophonia

Dryness

Weak

Nasal Breathing Unobstructed

Hoarse

Other Symptoms

Ringing

Pain

Accessory Sinuses

Choanae

Faucial Tonsils

Eustachian Tubes

Soft Palate

Uvula

Epiglottis

Ary-Epiglot. Fold R.

Vent. Bands R.

Aryt R.

L.

L.

L.

Final

L.

L.

L.

(FRONT)

Date

TREATMENTS AND REMARKS

MUNICIPAL SANATORIUM—OTISVILLE, N. Y.

(BACK)

SUMMARY CARD SOCIAL

MUNICIPAL SANATORIUM—OTISVILLE, N. Y.

Record No.

Date of (Admission
(Discharge

Length of Residence
Marital State
Color
Nativity
Religion
Addresses

Name
Address
Citizen? In U. S.
Names of Nearest Relatives or Friends

Name of Patient's Friends while at Sanatorium

Name and Address of Church Attended
Name and Address of Club, Lodge or Society
Name and Address of Private Physician.
Name and Address of Clinic
Discharged or Transferred to
Present and Previous Occupations (be specific) Dates and Wages

Occupation when Tuberculosis Developed
Work while in Institution, Remunerative

Department while in Institution
Aided by

SUMMARY CARD

MEDICAL

ETIOLOGIC FEATURES:

STAGE ON ADMISSION

Condition on Discharge

PREVIOUS HISTORY (including previous treatment, habits and diseases)

HISTORY OF PRESENT ILLNESS

Mode of Onset

First Noticed

First Symptoms Noticed

First Diagnosed

ON ADMISSION

Cough

Sputum

Character (with any changes)

Hemoptysis

Loss of Weight

Pain

Temp.

Night Sweats

Chilly Sensations

Endurance

Nervousness

Malaise

Oedema

Appetite

Digestion

Bowels

Most Pronounced Present Symptoms

SUMMARY FOR WOMEN

ON DISCHARGE:

Cough

Sputum

Hemoptysis.

Pain

Strength

Malaise

Night Sweats

Dyspnoea

Appetite

General Condition

Weight

Temp.

Do you feel able to return to your work?

Work during Treatment

PHYSICAL EXAMINATION:

Build

Complexion

Other Features

Sputum on Admission

During Treatment

On Discharge

Tbc. Complications on Admission

Non. Tbc. Complications on Admission

(BACK)

NAME

RECORD No.

DISCHARGE No.

DATE OF ADMISSION

DATE OF DISCHARGE

TUBERCULOSIS SANATORIUM

OTISVILLE, N. Y.

Form No. 33, O, 1916

(FOLDER FOR CHARTS)



MUNICIPAL SANATORIUM, OTISVILLE, 1906.

CHAPTER XVIII.

TRAINING SCHOOL FOR NURSES IN THE SANITORIUM.

The following application form, with explanatory notes, issued by the Trudeau Sanatorium, gives a fair idea of the lines along which such work should be undertaken. Many young women who have regained their health in the sanatorium, may serve two objects by taking up the profession of nursing. They provide themselves with a source of livelihood and fill a constant need for nursing the tuberculous in and outside of sanatoria. There are many special points in nursing this disease which differ from ordinary trained nursing, and which can be best taught and learned in a sanatorium school.

Application Form and Prospectus of the D. Ogden Mills Training School for Nurses, Trudeau Sanatorium.

Questions to be Answered by Candidate.

1. Name in full
2. Are you single, married, or a widow?.....
If married or a widow, have you children, and how many
How provided for?.....
3. Are you connected with any church?.....
Name denomination.
4. Give previous and present occupation, if any.....
5. Have you ever been connected with
any training school for nurses?.....
6. Have you ever done any nursing?.....
7. Are you now under engagement to or
negotiating with any other school?.....
8. Age at last birthday?.....
Date and place of birth?.....
9. Height?.....; Weight?.....
10. Where educated? Name school.....
11. Name of principal of school where educated.....
12. What are your scholastic qualifications?.....
13. Credentials signed by proper school
official accompany this application.....
14. What diseases have you had?.....
15. Have you ever taken treatment for tuberculosis?.....
16. Do you cough?.....
17. Are you hoarse?.....
18. Does your sputum contain tubercle bacilli?.....
19. Are your sight and hearing perfect?.....
20. What is your general physical condition?.....
21. Are you under your normal weight?.....
22. Are you free from domestic responsibilities which
might interrupt your course in the school?.....

23. Why and when do you wish to enter training?.....
24. Give name in full and addresses
of two persons as references.....
State how long each has known you.....
If previously employed, one of
these must be the last employer.....
25. Give name and address of relative or
friend to be notified in case of illness.....
26. Have you read and do you clearly
understand the regulations?.....
I declare the above statements to be correct.

Date.....

(Signed)

Candidate.

Address.....

Nearest telegraph station.....

This paper must be made out in the candidate's own handwriting and sent to Superintendent of Nurses, Trudeau Sanatorium, Trudeau, N. Y.

The training school course covers two years of theoretical and practical work and instruction at the Sanatorium. A theoretical course in Anatomy, Physiology, etc., Bacteriology, Hygiene, Sanitary Science, Materia Medica, Pediatrics, Dietetics, Elements of Medicine, Obstetrics and Gynecology, Surgery, Laboratory Work, Tuberculosis, Infectious Disease, Practical Nursing, Mental Diseases, Eye, Ear, Nose and Throat Diseases, is given.

The requirements are a two years' High School education or its equivalent, a satisfactory report of physical condition by one of our own examining physicians, a letter from your employer if employed, also one from your clergyman.

The remuneration is ten dollars per month, beginning at the end of a three months' probationary term. Books and uniforms are furnished by the school if applicant is accepted.

Nurses are on duty eight non-consecutive hours each day. A half-day off is given each week, and four hours on Sunday when possible. Nurses who have had tuberculosis will have especial advantages in the care of their health.

At the expiration of the course, nurses who have passed satisfactory examinations are awarded a diploma.

Requirements for Probationers' Uniforms.

Three dresses; eight aprons; six collars; one heavy white sweater; black shoes with rubber heels; colored petticoats to wear with uniforms.

The dresses must be of plain blue Chambray, with high neck and long sleeves, not shorter than 3½ inches from the floor, and should have a

deep hem, as this material shrinks considerably in washing. Most of the stores in the cities carry a dress suitable for nurses' uniforms called the "Royal" dress. The attached sample is of the correct shade. Aprons must be of the same length as the dress, with a four-inch hem, and should be $2\frac{1}{2}$ yards wide. Belt should be $2\frac{1}{2}$ inches deep. Three buttons and button holes. Aprons should be gathered on the band and should meet in the back. The probationers' apron is made without bib. Collars may be worn low.



M. B. Brown Printing & Binding Co.,
New York.



PUBLICATIONS

OF THE

DEPARTMENT OF HEALTH OF THE CITY OF NEW YORK

1. **ANNUAL REPORT.** A statistical and descriptive account of the year's work of the entire Department.
 2. **QUARTERLY REPORT.** Vital statistics and work performed for the periods ending March 31st, June 30th, September 30th and December 31st. This report is published in the "City Record," the official daily publication of the government of New York City. The small edition of reprints which was formerly issued has been discontinued.
 3. **MONTHLY BULLETIN.** Established in January, 1911. The Bulletin contains summary tables of vital statistics for the preceding month together with descriptive articles and notes intended for the instruction of the public and for the information of physicians and others concerned in public health work, to whom an account of the methods, aims and accomplishments of this Department may be of interest. The Bulletin is mailed without charge to a restricted list of libraries, publication offices, physicians, public health officials and others especially interested.
 4. **WEEKLY BULLETIN.** This contains a weekly summary of vital statistics and brief public health news of current interest. At the present time, only a small edition of reprints is available for mailing to public health officials and others particularly interested.
 5. **COLLECTED STUDIES FROM THE RESEARCH LABORATORY.** An annual collection of scientific papers representing the work done at the bacteriological laboratories for the year.
 6. **MONOGRAPH SERIES.** A recently established series of special papers by officials or employees of the Department, each dealing with some particular problem or phase of the Department's work. These papers appear from time to time, at no specified interval.
 7. **REPRINT SERIES.** The Department occasionally reprints at its own expense and distributes shorter papers published by its officers or employees in medical and other scientific journals. Such papers are published in a standard serial form, with a list of those available for distribution.
 8. **OTHER PUBLICATIONS.** The Department of Health also publishes numerous pamphlets of rules and regulations, methods of procedure, instructions and advice to the public on particular subjects, etc., which are not classified or listed.
-

The Department will enter into exchange of publications with public health, medical and scientific organizations, societies, laboratories, journals and authors. Applications for publications should be addressed to the Bureau of Public Health Education, Department of Health 139 Centre Street, New York City.

MONOGRAPH SERIES

- No. 1. The Registration and Sanitary Supervision of Pulmonary Tuberculosis in New York City. By John S. Billings, Jr., M.D., Chief of the Division of Communicable Diseases.
- No. 2. The Tuberculosis Clinics and Day Camps of the Department of Health. By John S. Billings, Jr., M.D., Chief of the Division of Communicable Diseases.
- No. 3. Typhoid Fever in New York City, Together with a Discussion of the Methods Found Serviceable in Studying its Occurrence. By Charles F. Bolduan, M.D., Assistant to the General Medical Officer.
- No. 4. The Division of Child Hygiene of the Department of Health of The City of New York. By S. Josephine Baker, M.D., Director of Child Hygiene. (Second edition, August, 1913.)
- No. 5. The Milk Supply of New York City and its Control by the Department of Health. By Ernst J. Lederle, Ph.D., Commissioner of Health, and Russell Raynor, Chief of the Division of Food Inspection.
- No. 6. A Guide to Some of the Hygienic Features of New York City. By Charles F. Bolduan, M.D., Assistant to the General Medical Officer.
- No. 7. Comments on Some Plans of Hospital Construction. By Hermann M. Briggs, M.D., General Medical Officer.
- No. 8. The Subsequent History of Patients Discharged from Tuberculosis Sanatoria. An investigation carried on by the Council of Jewish Women.
- No. 9. The Law of the Sanitary Code of the Board of Health of the City of New York. By George P. Foulk, LL.M.
- No. 10. Fourth Annual Report, Woman's Auxiliary to the New York Department of Health Tuberculosis Clinics, Year Ending November 1, 1914.
- No. 11. Health District No. 1 (Experimental Health District). Its Organization and Work Performed in First Quarter of 1915.
- No. 12. A Clinical and Sanitary Study of the Fur and Hatters' Fur Trade. By Louis I. Harris, Chief Division of Industrial Hygiene.
- No. 13. Over a Century of Health Administration in New York City. By Charles F. Bolduan, M.D., Director, Bureau of Public Health Education.
- No. 14. The Year Book of the Bureau of Preventable Diseases. By John S. Billings, Jr., M.D., Deputy Commissioner.
- No. 15. An Analysis of Mortality Returns of the Sanitary Areas of the Borough of Manhattan for the Year 1915. By William H. Guilfof, M.D., Registrar, and Shirley W. Wynne, M.D., Chief of Division of Statistical Research.
- No. 16. The Epidemic of Poliomyelitis (Infantile Paralysis) in New York City in 1916.
- No. 17. The Health of Food Handlers. Report prepared by Louis I. Harris, M.D., and Louis I. Dublin, M.D.
- No. 18. The Influence of Nationality upon the Mortality of a Community, with special reference to New York City. By William H. Guilfof, M.D., D.P.H., Registrar of Records.
- No. 19. The Establishment and Conduct of a Tuberculosis Sanatorium. By Charles B. Slade, M.D., Visiting Physician to the Municipal Sanatorium at Otisville, N. Y.